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WASHINGTON UNIVERSITY



ALBERT E. TAUSSIG, M.D., EDITOR.

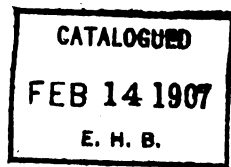
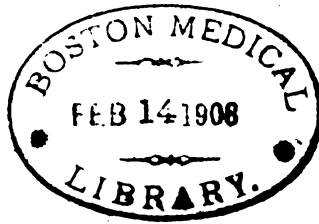
A. S. BLEYER, M.D., ASSOCIATE EDITOR.

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VOLUME III.

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## CONTENTS OF VOL. III.

### No. 1. July, 1904.

Death of Dr. Runge.....	1
-------------------------	---

#### Original Contributions:

The Medicinal Treatment of Valvular Disease of the Heart. By Walter Baumgarten, M.D.....	3
The Dietetic and Physical Treatment of Valvular Disease of the Heart. By Albert E. Taussig, M.D.....	7

#### Clinical Reports:

A Case of Emphysema of the Eyelid from Fist Blows about the Head and Face. By H. P. Wells, M.D.....	21
News and Personal Mention.....	22
News of the School.....	24

### No. 2. December, 1904.

Death of Dr. Prewitt.....	33
---------------------------	----

#### Original Contributions:

Obstruction, Partial and Complete, of the Intestinal Canal in Infancy and Childhood, considered from the Clinical Point of View. By E. W. Saunders, M.D.....	35
Class Work in Practical Anatomy. By R. J. Terry, M.D., with 9 figures and a table.....	43
Dietetic Treatment of Simple Constipation. By William H. Rush, M.D.....	61

#### Clinical Reports:

An Unusual Case of Multiple Neuritis. By Elsworth Smith, Jr., M.D. ....	69
News and Personal Mention.....	75

### No. 3. March, 1905.

#### Original Contributions:

The Problems of Internal Medicine. By William Sidney Thayer, M.D.,.....	91
The Promotion of Early Diagnosis in Malignant Disease of the Uterus. By H. S. Crossen, M.D.....	109
Surgery of Typhoid Perforation. By Edmund A. Babler, M.D..	121

#### Clinical Reports:

Foreign Body in Ear Fifteen Years. By A. Koetter, M.D.....	149
Primary Tonsillar Ulceration. By A. S. Bleyer, M.D.....	151
A Case of Tetanus — Recovery. By J. P. Simpson, M.D.....	153

(iii)

The Alumni Association.....	157
News and Personal Mention.....	161
Review of Certain New Work from the Universities and the Labor- , stories.....	164
Book Notices.....	168

## No. 4. May, 1905.

Calendar, Medical Department of Washington University.....	178
Corporation and Board of Overseers .....	175
Faculty, Instructors and Assistants.....	177
Officers and Committees.....	184
Staffs of Hospitals and Clinics.....	188
General Information .....	195
Historical Sketch.....	196
School Buildings and Equipment.....	197
Library and Publication.....	204
Requirements for Admission .....	206
Plan of Instruction.....	212
Details of the Plan of Instruction .....	214
Promotion .....	236
Requirements for Graduation .....	237
Prizes, Scholarships and Assistantships .....	238
Co-Operative Association.....	238
Young Men's Christian Association.....	239
Fees and Expenses.....	240
Names of Students in Attendance .....	245
Post-Graduate Students and other Matriculants.....	252
Graduates of 1904 .....	254
Hospital Appointments for 1904.....	256
Prizes and Honors for 1904 .....	258
Graduates of 1905.....	259
Hospital Appointments for 1905.....	260
Prizes and Honors for 1905.....	261
Rules for the Guidance of Students.....	262

## Clinical Reports:

An Unusually Early Case of Cancer of the Cervix Uteri. (From the Gynecological Clinic, Washington University Hospital: Prof. H. S. Crossen in charge). By Dr. Fred. J. Taussig..	264
Mycotic Vaginitis during Pregnancy. (From the Gynecological Clinic, Washington University Hospital: Prof. H. S. Crossen in charge), By Dr. Fred. J. Taussig.....	266

9947



## **Edward C. Runge, M.D.**

**Born September 7, 1856.**

**Died February 10, 1904.**

On the 10th of February, the community of St. Louis lost one of its most useful citizens and the Medical Department of Washington University a devoted alumnus. Dr. Edward C. Runge was born of German parents in the city of St. Petersburg in 1856. He received an excellent education there, graduating from the "Gymnasium" at the age of eighteen. The death of his father prevented him from entering the medical department of the University of St. Petersburg and forced him to accept a clerical position. The next eight years were devoted to the support and education of his younger brothers and sisters. This task having been accomplished, he came to this city in 1883 nearly penniless but full of hope and energy. His first years here were years of hardship and he was more than once near to starvation. With indomitable perseverance, however, he fought his way upwards, and in 1888 entered the St. Louis Medical College from which he was graduated in 1891. After a term of service at the Female Hospital he entered private practice, serving his alma mater as instructor in physiology and as assistant in the neurological clinic under Prof. F. R. Fry.

In 1895 Dr. Runge was appointed superintendent of the St. Louis Insane Asylum and entered upon the work for which all his previous life had been but a preparation. He introduced the modern methods in the treatment of the insane, abhorring the use of force and ruling by kindness and persuasion. He held the position for nine years, being reappointed by two successive mayors and resigning only when he found himself unable to prevent the introduction of politics into asylum affairs. A few days after his resignation he was seized with pneumonia and died on February 10th, 1904.

The most striking feature of Dr. Runge's character was his unswerving idealism. He came to this country glowing with enthusiasm for the land of freedom and equality, and nothing thereafter was able to dampen the ardor of his affection for his adopted fatherland. He brought the same idealism to his work among the insane, scorning compromise and half-way measures and so infecting even the indifferent and hostile with his own fervor that he accomplished the seemingly impossible. He took the same serious views of his duties as a citizen and as a member of the medical fraternity, fighting civic corruption and medical commercialism in season and out, with entire disregard of any ill effects upon his own prospects. His memory will long live as an example among all who knew him.

## THE MEDICINAL TREATMENT OF VALVULAR DISEASE OF THE HEART.\*

BY WALTER BAUMGARTEN, M.D.

In considering the medicinal treatment of valvular disease of the heart, it is to be approached less from the standpoint of the pathological changes in a specific valve, than from the point of view of the effect on the heart muscle of consequent changes in the work required of it. All valvular defects tend toward incompetency or failure of the muscle, and hence the treatment resolves itself largely into the treatment of heart failure. The necessity for this depends on the state of the muscle, and the degree of hypertrophy and dilatation which it has undergone. Whatever the cause of the heart failure, the problems to be met in its treatment are always the same: 1. To keep the heart from losing strength—that is, prophylactic treatment; and 2. To strengthen the heart when this is necessary. These problems involve, first of all, the avoidance of unnecessary labor to the heart, the supplying of a full measure of good nutritive blood, the prevention of an increase in body weight of any character, and the prevention of pulmonary and bronchial trouble. The means of meeting these indications are largely other than medicinal, and will not be discussed in this paper.

A heart with a valvular defect, whatever it may be, soon develops some degree of hypertrophy or dilatation or both. When the hypertrophy is sufficient to maintain compensation under ordinary and reasonable modes of life, and is at the same

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\* Read before the St. Louis City Hospital Alumni Association, June 18, 1904.

time not excessive, medicinal treatment should not enter into the consideration of the case; the case is then one of proper hygienic management. Two conditions may, however, supervene in a satisfactorily compensating heart, which will demand medicinal interference. Under favorable conditions of nourishment and a certain amount of physical exertion, the heart muscle without marked dilatation may so increase in thickness, and in the force of its contractions that it produces effects noticeable to the patient. These become apparent in the diffuse, forcible impulse at the apex, throbbing carotids, tense pulse, dull headache, and the sense of oppression in the chest. Such a condition must be met with sedatives. The other condition which may develop in a heart, primarily hypertrophied as the result of a valve-lesion, is that of inability to maintain the necessary blood pressure in the aorta and the peripheral vessels, and is associated with stretching of the heart muscle and feebleness in its contraction. This gives rise to the well known signs of loss of compensation, greater area of dullness, the feebly palpable impulse, irregular action, engorged veins, congested lungs and liver, slight cyanosis and oedema of the ankles. This latter condition calls for support, and is to be met by some cardiac tonic.

The overacting heart, with throbbing arteries, tense pulse, producing disagreeable sensory disturbances, is to be controlled, in addition to appropriate physical measures, by sedatives, among which aconite should be considered among the first. This drug produces a stimulation of the vagus center, and effects a slowing of the rate of the heart beat, a prolongation of diastole, and a weakening of systole—the precise results which should be produced to meet the condition. Under its influence a smaller amount of blood is propelled by the heart, and is thrown out with a less forcible contraction. An efficient dose may be found in two drops of the tincture every four to six hours, and this may be reduced both in quantity and frequency as the need of the drug disappears. Another drug — which produces its effect

directly on the heart muscle — is potassium bromide, which also serves as a general nervous sedative. A third drug which has been employed to combat cardiac overaction of this sort, is *veratrum viride*.

For the failing heart with oedema of the ankles and other signs of passive congestion, our reliance in the large proportion of cases is to be placed in *digitalis*. In chronic cases of valvular disease which are slowly losing their compensation, moderate doses — say ten to fifteen drops of the tincture three times a day, persisted in for several weeks at a time, and then intermitted, — may succeed in re-establishing and preserving compensation for many years. It produces slower, more regular and stronger contractions of the heart muscle, and raises the blood pressure not only by this direct action upon the heart, but by contracting the peripheral arteries. It thereby increases both the quantity of blood and the time during which, from systole to systole, it may enter the coronary arteries, in this manner gives opportunity for a better nutrition of the heart muscle, and by so much augments the strength of the heart. Its effect is thus not only a stimulation, but a means of securing greater intrinsic strength of the heart. Many cases may be maintained in a state of compensation by much smaller doses, for instance five drops twice a day given over long periods of time with proper intermissions. The adjustment of the dose in such a manner that symptoms disappear while at the same time the heart is not stimulated to the extent of wasting its energy, is the problem that must be worked out in the individual case.

In the cases of valvular disease in which the break in compensation is accompanied by rapid dilatation, and very compressible, rapid pulse, with engorged veins, congestion of internal organs, and dyspnoea and cyanosis, much larger doses of *digitalis* may be required. Fifteen drops of the tincture may be given every three hours, and, as the action of *digitalis* is slow, may be supplemented by alcohol in moderate doses, or by *strychnia*, or both alternately.



It is sometimes the case that while the heart muscle may be acting feebly, yet the peripheral arteries are contracted and maintain a resistance in working against which the muscle is wearing itself out, and becoming progressively weaker. It then becomes imperative to obtain a freer flow of blood in the vessels, and to increase the force of the heart. Under such conditions digitalis, on account of its effect in contracting the peripheral arteries, is an unsuitable remedy. For this purpose, strophanthus may be used — though it is a less efficient stimulant, — and with it nitroglycerin or the nitrites. The nitrites relax the peripheral vessels, but do not influence the muscular power of the heart. It is wise, however, to administer these two drugs independently, as the action of the nitrites is much more prompt than that of strophanthus, and correspondingly evanescent, and may require more frequent administration.

The anaemia which develops especially in aortic lesions, is to be combated medicinally by iron, which at times, by improving this condition and thereby the blood which reaches the heart muscle, accomplishes more than the cardiac tonics have been able to do.

My purpose in arranging this resumé has been to present for discussion rather the fundamental principles of the medicinal treatment of valvular diseases of the heart than a consideration of the action of a great number of drugs.

## THE DIETETIC AND PHYSICAL TREATMENT OF VALVULAR DISEASE OF THE HEART.\*

BY ALBERT E. TAUSSIG, M.D.

The possession of powerful and reliable cardiac stimulants should not make us oblivious to the importance of the dietetic and physical treatment of heart disease. In no other condition is it so essential that every detail of the patients' life be ordered and supervised by a physician. An often repeated error of diet, the abuse or disuse of exercise, may have the gravest consequences. I shall endeavor to sketch in only the briefest manner the essential factors in the non-medicinal management of the cardiac patient.

As regards the diet it may be said in general that it should not be too generous. Of course, this does not mean that the patient is to be starved. The physiological nourishment of any individual varies within pretty wide limits, and in health it is, within these limits, a matter of slight importance whether he eats a little more or less. In cardiac disease, on the other hand, the most advantageous dietary is that which approaches the lower limit of the normal. Patients so fed are spare, even a little anemic; they overtax the heart neither by carrying about with them a superfluous mass of fat nor by throwing upon their alimentary tract an unnecessary labor of digestion. In the obese, with fatty heart or with a valvular region, a reduction cure is indicated, but it must be far more slowly and cautiously undertaken than where the heart is normal. As regards the specific dietaries, these must

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\* Read before the St. Louis City Hospital Alumni Association, June 18, 1904.

vary with the individual patient. In general, concentrated and easily digestible foods should be preferred to bulky and less easily digestible ones. On the other hand where compensation is good and the patient tends towards constipation, a bulky diet with much residue may be indicated. Usually, however, the reverse will be the case and the patient will do best with four or five small meals daily consisting of a simple and concentrated food. While carbohydrates are not entirely to be forbidden, they should not form the bulk of the diet. They, more than other foods, tend to undergo fermentation in the digestive tract, and a stomach or bowels distended with gas and pushing upwards the diaphragm exert a very deleterious influence upon the diseased heart. For the same reason it is best not to take soups or water with the meals. Liquids not only dilute the digestive fluids, rendering them less potent, but also distend the stomach unnecessarily. They are much better taken between meals. Tobacco is almost always to be rigorously forbidden, its depressant action upon the heart rendering it a menace. Tea and coffee, as well as alcohol, are on the other hand powerful cardiac stimulants or irritants as the case may be. They should never be allowed the cardiac patient at his discretion as beverages, but should be forbidden, or prescribed in specific quantities as medicaments.

The general regulation of the patient's mode of life will vary widely with the gravity of his cardiac lesion, in particular with the degree of involvement of the myocardium. In general, if his compensation will permit he should have some quiet but reasonably absorbing occupation; this will best prevent him from becoming a neurasthenic. He should be out of doors as much as practicable whereby among other advantages he is more apt to obtain a profound, refreshing sleep at night. Often a change of climate is very beneficial. The opinion that high altitudes are contra-indicated in heart disease is correct only in so far as a residence in the mountains tempts one to prolonged excursions, mountain-climbing and the like. A quiet life among

the hills, with walks along levels or up very mild gradients is often of very great benefit to such patients. "Valvular lesions at the mitral orifice may at first give rise to palpitation, a feeling of oppression and insomnia, but this need not forbid such patients from living at a reasonably high altitude, if other pathological condition, such as anemia or dyspepsia, seem to indicate it. If the compensatory hypertrophy is threatening to give out, the mountain climate often acts as a sovereign remedy, in so far as the myocardium is at all capable of restoration. It often acts well also in lesions of the aortic valves of endocarditic origin in contradistinction to those that originate in aortic atheroma, as in conditions of arterial sclerosis and contracted kidney. In general it may be said that high altitudes are not well borne where the arterial tension is abnormally great, but that they are usually beneficial where this tension is reduced below the normal, provided always that this low tension has not its origin in an irreparable degeneration of the myocardium. Such cases should always strictly avoid high altitudes. While among the mountains, cardiac patients should of course be sedulously kept from any great physical exertion. For the first few weeks, absolute quiet is advisable" (Veragut). Where there is any dyspepsia or cyanosis a high altitude is contraindicated. Such patients had best remain at home; at most, an altitude no higher than that of their home, or a lower one, such as the sea-coast, is advisable.

Cardiac patients are now permitted and advised to take far more exercise than was customary in former years. Here, too, however, the amount and nature of the exercise that will be most beneficial depends on the nature of the case and will vary with each individual. Patients with well-compensated aortic regurgitation can, of all cardiac patients, endure the most exercise and sometimes thrive best with habitual violent physical exertion. Those with mitral insufficiency do nearly as well with vigorous exercise, while patients with aortic or mitral stenosis must be much more

careful. The age of the patient and his general mode of life must also be taken into consideration. Those over forty years old or they that have always lived a sedentary life will naturally not do well with the amount of exercise proper to a young man who has always led an active life. Especially where we have reason to suspect a serious involvement of the myocardium, our patients must be cautioned against over-exertion. A single acute dilatation of such a heart is often irreparable. Where the aortic lesion is due not to a past endocarditis but to an atheromatous degeneration of the aorta that has spread on to the valves, all violent exercise is equally contra-indicated.

When compensation has begun to fail, only exercise that is prescribed and carefully watched over by the physician is permissible. Formerly such patients were always kept very quiet. Oertel was the first to point out that this was a mistake, when he instituted his famous "terrain-cure" for the production of cardiac hypertrophy. He stated that his method was especially indicated in mitral insufficiency with imperfect compensation but was contra-indicated in acute endocarditis, aortic or mitral stenosis, cardiac aneurism, coronary or general atheroma, chronic Bright's disease. To these may be added all other cardiac patients in whom there is dyspnoea when they are at rest or undertaking moderate exercise such as slow walking. The Oertel cure requires the constant supervision of the physician. The patient is made to walk first only on level ground, later up and down a very mild incline and finally when compensation is greatly improved may undertake steeper gradients. An essential feature of the method is the regulation of the respiration. The patient is required to make half a respiratory cycle with each step, inspiration being performed with one step and expiration with the next. As soon as he feels the slightest dyspnoea, so that for instance he is unable to converse fluently, he must sit down and rest until the last trace of dyspnoea has disappeared. It is best never to prescribe a definite distance to be walked but rather that

the patient walk until a certain number of pauses for rest have been made. The Oertel treatment can evidently be carried out only in places specially arranged for it, not only because the gradients must be measured and labeled, but also because the frequent rests necessary require a profuse supply of seats.

A system of exercises, that has the advantage not only of being applicable anywhere but also of being much freer from danger and useful in more advanced cases of cardiac incompetence than the Oertel system, is that called the "Schott resistance exercises." It forms an essential part of the treatment at Nauheim in combination with the carbonated baths to be described later. These exercises consist of voluntary movements on the part of the patient consisting in turn of flexion extension and rotation of the limbs, body and head, all of which are carefully and delicately resisted by a skilled attendant. Space forbids my describing these movements in detail; one example must suffice.\* "Exercise No. 1. The arms are extended in front of the body on a level with the shoulders and with the palms of the hands touching. They are then slowly and steadily moved outward until at a line with the front of the chest, while at the same time the attendant gently resists this horizontal movement. The attendant now changes his hands, so as to exert pressure against the palmar surface of the wrists, and the patient slowly and steadily brings his arms back to the position whence the original movement started." There are nineteen or twenty such movements, that are all to be performed slowly and steadily without repetition and with sufficient rests whenever the patient shows any sign of respiratory or circulatory embarrassment. The signs for which the attendant is especially directed to watch, are "dilatation of

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\* The exercises are well described, illustrated by good photogravures, in "Diseases of the Heart and Arterial System" by Robt. H. Babcock, M. D. D. Appleton & Co. 1903. "The Schott Methods," etc., by W. Bezly Thorne, M. D. J. and A. Churchill. 1899.

the nostrils and sighing or irregular breathing, increasing duski-ness or pallor of the countenance, a drawn look about the mouth, yawning, perspiration and palpitation." As soon as any of these signs appear the exercises are interrupted at once and the patient is made to remain quiet until he is quite rested, whereupon they may be resumed. It is essential that the patient breathe quietly and naturally during the exercises and relax all muscles except the ones being resisted. The resistance which the attendant offers will gradually be increased as the patient's heart grows stronger, but at first it must be hardly perceptible and should never be so great that the patient experiences any difficulty in overcoming it. It need hardly be said that the exercises should only be done according to the directions of a physician and under his control. Unfortunately there are some masseurs who are undertaking to carry out this treatment on their own responsibility. Not long ago I was called to see a woman with an aortic insufficiency. I found her with a dilated heart, a weak and rapid pulse and much dyspnoea. On inquiry it appeared that until recently her heart had given her but little trouble. She had, however, been taking general massage, and the masseuse in addition to the usual rubbings had on her own responsibility been giving the patient "resistance exercises," making the patient flex her legs and then extend them forcibly against all the resistance that the masseuse was able to offer. Such methods cannot be too strongly deprecated.

Massage, while not exactly contraindicated in heart disease, is of far less value here than in many other conditions. Sometimes, however, if done in the evening, it may aid the patient in obtaining a good night's sleep. It is also sometimes of value in the intervals between the various resistance exercises. If done at all it should be performed very gently, and for not too long a time. Usually the limbs alone should be massaged, the abdomen remaining untouched, especially when there is any passive abdomen congestion. Sometimes direct massage of the region of

the heart is of value, but this should be done only by an expert or under the physician's supervision. According to Oertel this massage should be done as follows: The masseur, standing behind the patient, lays his hands upon the patient's thorax, one on either side, in the axillary line at about the fifth and sixth ribs. With the beginning of expiration he begins to exert a slight pressure which he constantly increases, moving his hands downwards and forwards over the seventh and eighth costal cartilage until, with complete expiration, the masseur's hands, exercising the maximum pressure, meet at the xiphoid process. With inspiration, the pressure is relaxed and the masseur's hands slowly return to their original position.

Of all the physical procedures in the treatment of heart disease, none are of greater interest and importance than the hydrotherapeutic ones. According to the particular indication to be satisfied, local as well as general applications may be used with good results. Winternitz recommends the local application of cold to the precordial region: 1, in nearly all conditions of weak heart, whatever their origin; 2, whenever the blood pressure is very low; 3, in passive congestion of the lungs, pulmonary edema and the like. Personally I have found this procedure most useful where there is a tumultuous action of the heart, whether this be due to an acute endocarditis or to a cardiac neurosis. Here the local application of cold slows and strengthens the heart's action so strikingly that it well deserves its appellation of "the digitalis of hydrotherapy." Its only contra-indication is advanced fatty degeneration of the myocardium such as occurs in last stages of valvular disease, in diabetes and in nephritis. The best method of applying cold locally, undoubtedly is the Winternitz cold coil, in which a stream of ice water is made to circulate through a coil of rubber tubing applied to the cardiac region. Similar results may, however, be obtained by means of an ice-bag or of cloths wrung out in ice water and changed frequently. The local application of heat has also been recommended. It is



said to be indicated "whenever the weakened heart-muscle produces a great number of very rapid, feeble beats. Here hot applications often produce within a few minutes, even though it be but temporarily, a distinct diminution in the size of the dilated heart, but above all a marked strengthening and therefore slowing of the heart beat." Personally, I have no experience with this procedure, and it seems in general to be but little used. If the local application of heat is sometimes beneficial, its general application to the entire body is not free from danger and should be used only with the greatest caution. In cases of obstinate hydrops or anasarca due to cardiac weakness, one may often be tempted to use the hot bath, dry hot air or the steam cabinet to produce diaphoresis. F. A. Hoffmann, Partos, Matthes and others advocate this procedure, but the depressant effect upon the heart of the general hot bath often does more harm than the diaphoresis does good. In a case of aortic stenosis and insufficiency, that I had occasion to see about a year ago, I believe the steam cabinet clearly hastened the patient's death. The case was one of broken compensation with great edema of the legs which resisted the administration both of cardiac tonics and of diuretics. The steam-cabinet exercised a beneficial effect upon the anasarca, but since the cardiac dilation seemed to grow worse the patient was instructed to discontinue its use. As the edema increased, the patient of his own accord again made use of the steam-cabinet and was dead a few hours after. The case would probably have ended badly in any event, but one could not help feeling that the steam bath had hastened matters.

The general application of cold on the other hand, especially in the form of the cold pack is both safe and useful. In the insomnia which is often so distressing a symptom of failing compensation, the cold pack, if not left on too long, is a very soothing procedure and may often yield the exhausted patient a good night's rest. It probably finds its greatest field of usefulness in those cases in which, for one reason or the other, opium cannot be used.

During the last ten years the value of the Nauheim treatment of cardiac incompetence by means of carbonated brine baths has become more and more generally recognized. Nauheim is a pretty little village, situated nearly in the center of Germany on the eastern slopes of the Taunus range. From all parts of the world, men and women with cardiac disturbance of some sort congregate there to be cured or at least relieved. It is much less a place for social diversion than the other German bathing resorts: everything, hotels, villas, boarding house, baths, the pretty park with its gently sloping walks, all seem organized with the sole object of producing cardiac hypertrophy. For miles about, in the surrounding country, all the roads are graded, measured and labeled for use according to the Oertel "terrain-cure." There is, however, nothing schematic about the treatment practiced there. The Nauheim physicians are strongly imbued with the importance of individualizing and probably no two patients receive the same treatment. All the physical and dietetic methods applicable to conditions of cardiac disturbance are used as the case may demand. If the Nauheim physicians have one fault in common, it may be said to lie in a rather one-sided neglect of the medicinal treatment of these conditions. The central features of the treatment practiced at Nauheim, however, are the "resistance exercises" mentioned above and the carbonated brine baths, the so-called "Nauheim baths." These are given by trained attendants in the well appointed bath houses scattered throughout the Kur-park. The treatment is usually begun by means of a simple diluted brine bath, from which all the carbonic acid gas has escaped. This is given at nearly body temperature and for only a few minutes. The bath is taken once daily with an intermission every third or fourth day. As the patient's heart grows stronger, the temperature of the bath is slowly reduced, its concentration increased and its duration prolonged. Later, varying from the second to the fifth week the carbonated brine baths are given. Their strength too is slowly increased until,

in exceptional cases, the patient is given the so-called *Sprudelstrom-bad*, effervescent current bath. Here the patient lies in a current of briskly effervescent water. It represents the highest grade of hydro-therapeutic stimulation and is but rarely used. The carbonated baths are extremely pleasant to the patient. On first entering the water he feels a little chilly, but this is soon replaced by a glow and a feeling of exhilaration. The bath must be interrupted before this feeling is replaced by one of depression. The objective effect of the bath is often almost as striking as the subjective sensation. I have more than once seen a dilated heart shrink perceptibly, as estimated by percussion, during a single bath, clearly on account of the distended ventricle being able better to empty itself. To be sure, the dilation always returns during the succeeding twenty-four hours, but if the treatment is successful, each relaxation of the heart is a little less than the preceding one. After the bath the patient goes to bed for an hour. The rest of the day is devoted to other physical methods of treatment, to recreation and to rest.

Just how the carbonated baths manage to stimulate the heart is not quite clear. One theory explains their action by assuming that they stimulate the sensory nerve endings of the skin, thereby reflexly stimulating the heart; the other assumes a direct action of the carbonic acid gas upon the vaso-constrictor fibres of the cutaneous blood vessels with a resultant increase of blood pressure. The former theory probably more nearly represents the truth, particularly in view of an interesting phenomenon to which Senator has recently called attention. The sensation as regards heat or cold that substances produce when touched, depends not only upon their temperature but also upon their power of conducting heat. Thus on a cool day, while a marble slab and a fur rug may have exactly the same temperature, they impress the bare foot that treads on them very differently. There is a similar difference between the heat-conducting power of water and of carbonic acid gas, so that as the patient lies in the

carbonated bath, his body nearly covered by tiny bubbles of the gas, we have a sensation of warmth where each bubble touches the skin and of cold wherever the water does so. It is, one might say, as if the body were covered with minute alternating fragments of fur and marble. This alternation of hot and cold forms a very efficient stimulus, more delicate but similar in principle to the alternate hot and cold baths used in resuscitating new born infants or "common drunks." The theory, too, explains why the carbonated baths are efficient only at a limited range of temperature. The latter, clearly, must not be so high that both gas and water feel warm, nor so low that both feel cold.

While the best results from these baths are unquestionably to be obtained at Nauheim, where the older physicians have a vast experience in their application and where the patients, away from their business or social duties, must necessarily devote themselves entirely to the restoration of their health, they can often be very efficiently imitated at the patient's home or in a hospital or sanitarium. The first, mild brine baths should contain about 1 per cent sodium chloride, which should gradually be raised to 2 or 3 per cent. The 0.2 to 0.5 per cent. of calcium chloride present in the Nauheim water may be added as such, or by using the imported Nauheim salt or even common sea-salt. It is not certain, however, that the calcium chloride is an essential factor in the therapeutic activity of the Nauheim bath. The effervescence may be produced by the action of hydrochloric acid on bicarbonate of soda. The latter is dissolved in the bath-water, while the former is spread over the surface. Bezly Thorne has suggested a convenient method. "The stopper of the bottle containing the acid is loosened, but retained in position; the bottle having then been inverted and lowered until its mouth is just below the surface of the water, the stopper is withdrawn, and the bottle is moved about so as to diffuse a layer of acid as uniformly as possible over the surface of the bath. By this means the bath will be prepared in about five minutes.

It will be useful to employ baths of three degrees of effervescence:

Mild . . . . .  $\frac{1}{2}$  lb.  $\text{NaHCO}_3$  to  $\frac{3}{4}$  lb.  $\text{HCl}$ . (25%).  
 Medium . . . . . 1 lb.  $\text{NaHCO}_3$  to  $1\frac{1}{2}$  lb.  $\text{HCl}$ .  
 Strong (Sprudel strength) 2 lbs.  $\text{NaHCO}_3$  to 3 lbs.  $\text{HCl}$ ." \*

The above figures are calculated for the average full bath of 50 gallons.

A much more convenient method consists in the replacement of the  $\text{HCl}$ . by means of compressed tablets of acid sodium sulphate. The latter are large hard tablets, non-delinquescant, and may be kept indefinitely. The manufacturers† supply them in a wooden box containing eight tablets wrapped in tin foil, and four packages of sodium bicarbonate, each of which corresponds to two tablets. The tub having been filled with water, the tablets, broken up by means of a hammer, are placed on their tin foil wrappers on the bottom of the tub and the corresponding amount of alkali placed upon them. Effervescence begins promptly, and in a few minutes the bath is ready for use.

As at Nauheim, so in the use of the artificial carbonated bath, all schematic treatment is to be deprecated. In some cases the increase in strength of the baths will be fairly rapid, in others very slow. The following scheme, suggested by Satterthwaite, may perhaps be offered as an example of an average course of six weeks duration:—

“FIRST WEEK (No. 1 Bath). — One-half per cent. plain warm salt bath. (Two pounds of bathing salt to 50 gallons of warm water.) Temperature,  $98^\circ \text{F}$ . Duration, four minutes. Intermission on the third and sixth day of this week.

“SECOND WEEK (No. 2 Bath). — Three-quarters per cent. warm

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\* W. Bezly Thorne. The Schott Methods, etc., p. 21.

† In this country, The Cassebeer Pharmacal Co., 108 Fulton street, New York.

salt bath. (Three pounds of bathing salt to 50 gallons.) One-quarter per cent. carbonic acid gas (two disks to one package). Temperature, 97° F. Duration, six minutes. Intermission on the fourth day of this week.

"THIRD WEEK (No. 3 Bath). — One per cent. warm salt bath. (Four pounds of bathing salt to 50 gallons.) Temperature 96° F. Carbonic acid gas one-half per cent. (four disks to two packages). Duration, eight minutes. Intermission on the fourth day.

"FOURTH WEEK (No. 4 Bath). — One and a quarter per cent. salt bath. (Five pounds of bathing salt to 50 gallons.) Nauheim concentrated brine salts (Mutterlange salts), eight ounces, or a half a pint of the liquid salts. Carbonic acid gas three-quarters per cent. (six disks to three packages). Temperature, 95° F. Duration, ten minutes. Intermission on the fourth day.

"FIFTH WEEK (No. 5 Bath). — One and a half per cent. salt bath. (Seven pounds of bathing salt to 50 gallons.) Concentrated brine (Mutterlange salts), three-quarters of a pint, 12 ounces. Carbonic acid gas, three-quarters per cent. (six disks to three packages). Temperature, 94° F. Duration, 12 minutes. Intermission on the fifth day.

"SIXTH WEEK (No. 6 Bath). — Two per cent. salt bath. (Ten pounds of bathing salt to 50 gallons). Concentrated brine salts (Mutterlange), sixteen ounces, or one pint of the liquid salt. Carbonic acid gas, one per cent. (eight disks to four packages). Temperature 93° F. Duration, fourteen minutes. Intermission on the fifth day." \*

While the above may be considered an average course, it will practically always require modification when applied to a concrete case. Some patients, whose myocardium is nearly intact,

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\* Nauheim Methods in Chronic Heart Disease with American Adaptations. By THOS. E. SATTERTHWAITE. International Clinics, Vol. 1, Thirteenth Series.

will do well under a more rapid increase in strength, others will require a slower progress. Those who are easily chilled will require a slower reduction in temperature than those that have been used to cold baths. The patient's own condition, especially subjectively, is the only guide. He should feel not only comfortable in the bath but should desire it as a distinctly pleasant sensation. Any chilliness, during or after the bath, any dyspnoea, palpitation or cyanosis demand a modification of the bath or even intermission of one or several days. Cases with advanced degeneration of the myocardium demand especial precautions, and for them the increase in strength of the baths should be much slower than in the example quoted above, the use of the carbornated bath being postponed to the third or even fourth week. In both of the two cases of advanced myocarditis, whose treatment with these baths I had occasion to observe (one at Nauheim and one at home), the course of treatment, in spite of the greatest care and conservatism, was interrupted by an ugly relapse which compelled the temporary abandonment of the baths. The relapse clearly was due to a too rapid increase in the strength of the baths. The first of the two cases eventually derived a great deal of benefit from the treatment, although the course required twelve instead of six weeks. The second case is still under treatment.

That the dietetic and physical treatment of heart disease will ever drive into disuse its medicinal treatment would hardly be claimed by the most enthusiastic "hygienist." At the last, there is nothing that will serve us as well as digitalis. Nevertheless the procedures described above will always be useful as valuable adjuvants to the medicinal treatment. In comparatively mild cases of incompetence they may even enable us to hold our cardiac tonics in reserve, so that at the last, when grave heart failure threatens, digitalis and the other cardiac stimulants may exert their full effect upon an organism not yet habituated to them.

## CLINICAL REPORTS.

### A CASE OF EMPHYSEMA OF THE EYELID FROM FIST BLOWS ABOUT THE HEAD AND FACE.

BY H. P. WELLS, M.D.

No great importance attaches to this sign per se, which may result from injury to the structures about the nasal and orbital cavities, and usually no active treatment is required other than what might be indicated, irrespective of the emphysema.

Fracture of the delicate and fragile inner wall of the orbital cavity, involving the ethmoidal, lachrymal, or superior maxillary bones or the air cells of cranium, is liable to be accompanied by emphysema of the loose tissues of the orbit and palpebral regions, on account of the relation of these parts to the air tract, air passing from the nasal cavity through the fractured bony wall and into the tissues of the orbit.

The emphysema probably does not occur until, by blowing the nose to clear it of blood or secretion, air is forced out in the line of least resistance through the newly made passages.

A. B. was struck several fist blows in the right temporal region and about the face. One hour later he consulted me on account of a puffiness of the right eyelid, which he said occurred immediately after an effort to clear the nose. Palpation showed the puffy swelling to consist of air with the peculiar crepitant feel which could not be mistaken. The patient was asked to hold the nose and mouth shut and to blow slightly, when the distension was quite plainly seen.

It is impossible to say exactly where the fracture is located



in these cases as the fracturing force may be exerted by contrecoup as well as by direct violence.

The practical bearing of these cases is indicated by cases on record in which serious emphysema resulted from unfortunate use of the Eustacian catheter and air bag, as a result of puncturing the mucous membrane of the pharyngeal wall or forcing the catheter into an ulcerated patch in the vicinity of the tube.

Patients suffering from injuries in which emphysematous distension is noticed should be cautioned not to blow the nose until the injured parts have sufficiently healed to close the false passages.

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## NEWS AND PERSONAL MENTION.

On the second of June a well-attended meeting was held at Memorial Hall in commemoration of the civic and scientific service of the late Dr. Edward C. Runge, formerly superintendent of the St. Louis Insane Asylum. Mr. E. C. Eliot acted as chairman and introduced the speakers. A sketch of Dr. Runge's life, chiefly autobiographical, was given by Dr. Otto Heller, and an address on Dr. Runge's personality by Dr. C. B. Burr, the secretary of the Medico-Psychological Association. Dr. Robert Luedeking spoke on Dr. Runge as a student and as a teacher, Dr. F. R. Fry of his medical work, and Dr. G. Baumgarten of his influence over his charges. The Rev. J. W. Day closed the exercises by an address on the civic lesson of Dr. Runge's life work.

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The following appointments were made by the Faculty at the annual meeting in June, 1904: —

Dr. H. M. Loewenstein, appointed Clinical Assistant, Department Pediatrics, O'Fallon Dispensary.

Dr. A. F. Koetter, appointed Instructor in Otology.

Dr. Fred Fahlen, appointed Chief of Medical Clinic and Chief of Pathological Laboratory, Department of Medicine, Mullanphy Hospital.

Dr. George O. Gauen, appointed Junior Assistant and Resident Physician Obstetrical Out Clinic, O'Fallon Dispensary.

Dr. C. A. W. Zimmermann, appointed Instructor in Medicine.

Dr. W. T. Hirschi, appointed Clinical Assistant, Department of Medicine, O'Fallon Dispensary.

E. P. Cockrell, Ph.B., Assistant in Pharmacy Laboratory.

Dr. R. Walter Mills, Instructor in Pathology and Bacteriology.

Dr. Vilray P. Blair, Associate Professor of Anatomy.

James Francis Abbott, A.B., Jan., 1899, Stanford University; Graduate student, Stanford, 1899-1900; Imperial University of Tokyo, 1900-01-02; University of Chicago, 1903-04; Chief Assistant Stanford Univ. Library, 1898-99; Instructor in English, Shigaken Shogyo Gakko (Trade School), Otsu, Japan, 1900-02; Professor of English Language, Imperial Japanese Naval Academy, 1902-03; Fellow in Zoology, University of Chicago, 1903-04.

Publications:

The Marine Fishes of Peru, 1899, Proc. Natl. Acad. Notes on Chilean Fishes, 1899, *Ibid.* Fishes of Pei Ho River, China, 1900, Proc. U. S. N. Mus. Preliminary Notes on *Cœloplana*, 1902, Annot. Zööl. Japaneus, Tokyo.

Appointed Associate Professor of Histology and Embryology.

Dr. W. L. Johnson, appointed Instructor in Clinical Pediatrics.

Dr. Theodore Greiner, appointed Clinical Asst. Department Dermatology, Mullanphy Hospital.

Dr. John C. Morfitt, appointed Instructor in Clinical Surgery.

Dr. M. Wiener, appointed Instructor in Ophthalmology. Polyclinic.

Dr. H. V. Wilson, appointed Clinical Assistant, Department Ophthalmology. Polyclinic.

Dr. Ernst Saxl, appointed Clinical Assistant, Department Ophthalmology. Polyclinic.

## 24 MEDICAL BULLETIN OF WASHINGTON UNIVERSITY.

Dr. William Lawrence Nelson, Clinical Assistant, Department Neurology. Polyclinic.

Dr. F. C. Simon, Clinical Assistant, Department Neurology. Polyclinic.

Dr. C. D. Scott, Senior Assistant, Department Dermatology. Polyclinic.

Dr. M. Frankenthal, Junior Assistant, Department Surgery. Polyclinic.

Dr. S. E. Newman, Junior Assistant, Department Surgery. Polyclinic.

Dr. Ernst Jonas, Instructor in Clinical Surgery.

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## NEWS OF THE SCHOOL.

The study of our announcement for the session of 1904-1905, which went out as the April number of the BULLETIN, should be replete with interest for our alumni and our friends. The general outline of the course, laboratory facilities, clinical facilities, requirements for admission and graduation, hospital appointments, etc., are contained in this catalogue.

To those familiar with the needs of modern medical education it would be superfluous to call attention to the value and absolute necessity of complete laboratory equipment and hospital provision for the purpose of thorough instruction. As has well been said: "It is important that the student be taught systematic methods of accurate observation and investigation in laboratory and clinic; that the student should learn how to utilize the experiences of his predecessors in interpreting his findings, and how to plan a rational mode of treatment."

To this end, this department, after having placed itself for many years on a University basis for the work of the first two years, now provides a University Hospital, wholly and entirely under the control of the Faculty, and available for bedside instruction, in

the strictest sense of the word. The buildings on Jefferson and Lucas avenues will be converted into a large, modern, general hospital of 100 beds. The hospital will be ready in October, and will be devoted entirely to medical and surgical instruction. This will give the student the most excellent and advanced opportunities possible.

Our large dispensaries on Locust street and on Jefferson avenue are operated in connection with this hospital, affording experience and training in all the general and special departments of study.

Our other hospitals, the Bethesda Hospitals and Mullanphy Hospital, are also under our complete control. BEDSIDE WORK IN SECTIONS, with work-periods of several weeks in succession, brings about the immediate contact of student and clinical subject. All this is a new departure in medical education in the West.

To be more specific, our course throughout is one of manual and mental training. The student is in a training school of all the faculties of his perception, the eye and the ear, the sense of touch, etc., and must translate his findings into definite conclusions. "The student is taught to consider that he himself is undertaking a research, that he is rediscovering for himself what others have found out before him." Thus, in the non-clinical subjects, the laboratory and practical side is especially developed, leading to enthusiasm both of teachers and of the student.

The departments of anatomy, chemistry, histology and embryology, physiology, pathology and bacteriology are each in the charge of a teacher who gives his entire time to his special subject, for which he has been trained and which is his life-work. We are pleased to announce, that Professor J. F. Abbott has been chosen to teach embryology. Anatomical relations, chemical reactions, physiological processes, drug manifestations, etc., are observed by the student by actual work with the test-tube, the microscope and other apparatus of precision.

Later in the course the scientific investigation of disease in the clinical laboratory has reached a very high order of development.

The clinical teaching in the hospitals and ambulatory clinics is absolutely practical, in that small sections examine the patients in the dispensaries, and small sections are given bedside-work in the hospitals. Thus small classes are working simultaneously in Medicine, Surgery, Gynecology, Eye and Ear and Throat diseases, Skin diseases, Orthopedics, Children's diseases, etc. The aim is to give hospital teaching alone for the whole of the fourth year of medical study. Our hospitals, being our own and teaching-hospitals only, are being developed from year to year with this end in view.

Our students secure an exceptionally good course in practical obstetrics through the Obstetrical Out-Clinic of the O'Fallon Dispensary and the Obstetrical Clinic at the Bethesda Hospital. Thus each candidate for the degree is enabled to attend at least three cases of obstetrics during the fourth year, the number running as high as eight cases of confinement for each man. Manikin practice in sections is thoroughly done by each student.

From the foregoing, it is clear that our students are expected to take nothing for granted. They are urged to work out the problems of medicine themselves, and it is constantly impressed upon them, that more mistakes are made in the practice of medicine by failure to *examine* and *look* and *search*, than by lack of knowledge. "*Examine first, then weigh, then aid.*"

We lay claim to the three essentials in medical education, that Dr. John H. Musser has lately emphasized: Individual instruction; well equipped laboratories; large clinical advantages, with clinical material directly under faculty control.

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A word in regard to the requirements for admission, which every student should know before deciding to go elsewhere. Inasmuch as the requirements preliminary to the study of medicine, and the registration of physicians, vary widely in the different States in this country, our requirements for admission and graduation have been so regulated as to conform in all

respects to the special laws, adopted by the State Boards of Health in every State in the Union, governing admission to medical practice. It is therefore particularly enjoined upon students to conform to our requirements for admission. Graduation from this department precludes the possibility of non-recognition of diploma by the Board of Health or Licensing Board in the State in which the graduate wishes to reside and practice his chosen art. Many States require documentary evidence of preliminary education, the minimum of which is contained in our catalogue, pages 37-38, 39-40.

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In this connection, a recent attempt of the State Board of Health of Missouri to establish a standard of preliminary requirements of applicants to practice medicine in Missouri, is of great interest.

The State Board of Health, in order to curtail the scope of many schools in this State, that have no regard for the class of students they get, but take them all in without any previous preparation, felt the importance of establishing a preliminary requirement to prevent so many young students flocking to these irresponsible schools.

The following was therefore enacted: —

#### PRELIMINARY REQUIREMENTS.

Every applicant for license to practice medicine in the State of Missouri shall present documentary evidence of having a University or College degree or High School diploma; in lieu thereof, said applicant must pass a satisfactory examination before the State Superintendent of Public Instruction upon all branches embraced in a four years' High School course.

This is an absolute requirement, and no applicant will be allowed to enter the examination without having complied with this order.

In effect after July 5th, 1904.

A copy was sent to each school — we felt a mild, humorous interest, well knowing what would follow. We knew they would recant. Four days later the expected happened, as expressed in the following official notification: —

“ Last week we printed and forwarded to you, preliminary requirements for applicants to take the examinations before the State Board of Health. *There has been some objection raised against this order*, (which is based entirely upon the law), viz.: on the ground, that it would necessitate a double expense on the part of the applicant to go to Jefferson City, Mo., to take this examination in the event that they did not have a high school diploma nor a college or university degree. This has been a pretty hard proposition to settle and the Board is not inclined to do anything that will in any way injure a medical school in this State. Therefore, as this objection has been raised, we will ask you to prepare a preliminary requirement after carefully considering the matter and we would be glad to have you consult with the other officers of your institution and forward your decision to the Secretary of the Board.”

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Our reply to this communication will be a reference to our entrance requirements, set forth in our catalogue. These requirements are equal to those of the foremost schools of the country, in fact are exceeded only by Harvard Medical School, and Johns Hopkins. In these institutions, an A. B. degree is the pre-requisite to matriculation.

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The strict maintenance of our requirements for admission has borne its fruits in the recognition of our diplomas. The requirements for license to practice are nowhere so stringent as in the State of New York. The Board of Regents of the

University have supervision of the regulation of admission to practice in the State. Our diplomas are recognized by this body for admission to the licensing examinations. Correspondence is now going on favorably, in order that we become recognized by the Royal Colleges of Physicians and Surgeons in England.

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Students from other accredited medical colleges are constantly seeking admission to advanced standing in our school. The law governing such advancement is set forth on page 41 of the catalogue. In order to exclude undesirable men, and undesirable schools, the law is framed, that certificates of standing *elsewhere* cannot be accepted in lieu of examinations. Exceptions, however, are made on credentials from the *best* schools, requiring *equivalent* entrance conditions and giving an *equivalent* course of instruction.

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The school has purchased an apparatus, designed by Carl Zeiss of Jena, called the Epidiascope. The instrument is on exhibition at the Educational Building, World's Fair, in the auditorium of the German Medical Exhibit. Demonstrations of its working are made every Wednesday afternoon, at four o'clock. The profession is invited to attend these exhibits. Our alumni visitors should not fail to acquaint themselves with the revelations in projection of both opaque and transparent objects.

The Epidiascope is an apparatus for the projection of objects lying in a horizontal position. It employs reflected light in the case of opaque, and transmitted light with transparent (or at least translucent) objects. As compared with other large projection apparatus with an optical bench, the Epidiascope possesses the following characteristic advantages, viz.:

1. Greater latitude in the shape and size of objects.
2. When reflected light is employed, the illumination is more perfect.



3. Transition from operation with reflected to transmitted light is effected with greater speed and convenience.

4. The apparatus is easily adjusted for projection obliquely upwards.

5. The several component parts are better protected against dust and improper usage.

The range of usefulness of the Epidiascope in teaching is a varied and wide one, and this is further enhanced by a special accessory apparatus for micro-projection.

Only one other institute in the United States has such an apparatus at the present time. We learn it is not provided with the projection microscope, however.

Our apparatus, when turned over to us, is to go either into the new University Hospital, or into the Locust street building.

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Dr. Elisha Hall Gregory, junior, has been called to fill the Robert Laughlin Rea Professorship of Anatomy in the "North-western University Medical School." Dr. Gregory was heretofore Assistant Professor of Anatomy in the University of Pennsylvania, whither he was called after several years of study in embryology with Professor Kupfer in Munich. Dr. Gregory took his degree in 1885 in this medical department, (St. Louis Medical College), and served as Instructor in Practical Anatomy in the school from 1889 to 1897. Before going abroad, he spent a period in the Harvard Medical School as Instructor in Histology and Embryology.

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We wish to draw the attention of our alumni, and visitors to the World's Fair, particularly to the exhibit of the school in the Educational Building, where it is placed with that of Washington University. The features of it are students' work done in bone-modeling in clay, photographs of class-work in clinical diagnosis, chemistry and microscopy, exhibit of plan of dissection, skia-

graphs used in teaching fractures and dislocations, a case of pathologic specimens and bacteriologic specimens used in teaching, a transparency-case of microphotographs, etc. Besides, some original work of the teachers is shown.

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Another exhibit of the school is contained in the "St. Louis Pathologic Exhibit," gotten up by our Dr. Elsworth Smith and intended as an exhibit of the American Medical Association. It is placed on one of the balconies in the Educational Building and consists of four large cases, well arranged. The contents of two of the cases are entirely made up of valuable teaching material loaned by our school. The third is a bacteriologic exhibit of the St. Louis Health Department. The fourth case contains pathologic specimens from the City Hospital, prepared and mounted in our Pathological Laboratory, and specimens loaned by physicians of St. Louis.

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Medicine is well shown in the magnificent display of Germany, which is exhaustive, and a school complete. Japan also shows vaccines and serums and their mode of preparation. Harvard Medical School has an instructive exhibit.

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The Tuberculosis-exhibit should not be missed. It is truly educational, and the people should be particularly interested, and learn the simple methods, that have proven so effective in the combat against this most destructive infection.

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It seems, that the old "saw," that it takes a surgical operation to get a joke into a Scotchman's head, applies to serious things also. The intelligent world to-day knows, what can be done to stay tuberculosis, not so much perhaps in the unfortunate

victim, as in prevention of spread, dissemination, and consequent limitation and vast economic benefit to the commonwealth.

The study of tuberculosis has been most satisfactory in good results, but must be kept up and encouraged. But Mr. Andrew Carnegie, of library fame, recently wrote Dr. Trudeau, of Saranac, the pioneer fighter of tuberculosis in America, in reply to a request for aid in the struggle, in a blunt and brutal way: "I help those that can swim, not those that are sinking."

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Dr. William C. Glasgow, of the Medical Department, has been named chairman of the section on Otology and Laryngology of the Division of Medicine, International Congress of Arts and Science, to be held in St. Louis, September 19-25.

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Johns Hopkins suffered a crippling loss of income through the Baltimore fire, but the deficiency, we learn, has been made up by a generous gift. Dr. Osler's jocose encouragement: "That there is nothing like a fire to make a man do the Phoenix trick," has again been verified.

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Dr. S. P. Budgett, our physiologist, is at work in England during the vacation.



## **Theodore F. Prewitt, M. D.**

**Born, March 1, 1832.**

**Died, Oct. 17, 1904.**

Dr. Theodore F. Prewitt died at his home, in this city, Oct. 17, 1904, aged 72. Dr. Prewitt was born in Fayette, Howard County, Mo., on March 1, 1832, the son of Joel and Mary Trimble Prewitt. Owing to the death of his father, and being one of a family of eleven, he was thrown upon his own resources at the early age of 14. Having by his industry and perseverance acquired a good education, he was enabled to teach school, which he did for a number of years.

At this point he was attracted to the study of medicine and he presently entered the St. Louis Medical College, from which institution he was graduated in 1856, having been married to Miss Mary Ingram, of Virginia, during the last year of his medical course. After the death of his wife in 1862, he came to St. Louis and opened an office at Broadway and Locust. He was again married in 1871 to Miss Mary Sowers and the same year was appointed superintendent of the City Hospital, which position he held for three years, at the expiration of which time he resigned his position in order to prosecute his surgical studies abroad, when he spent some time at a number of the leading European hospitals.

On his return to St. Louis he accepted the chair of

Surgery in the Missouri Medical College, and later was elected to the Deanship, which position he held for some years.

On the consolidation of the Missouri Medical College and the St. Louis Medical College to form the Medical Department of Washington University, he was continued in the chair of Surgery. He held this position until his death. It was only during the last year of his life that his failing health prevented his giving his full time and attention to the duties of his position.

For twenty-five years he was surgeon to the St. John's Hospital and the surgical clinic at that institution, where he left behind him a record that may well be envied.

Dr. Prewitt was a man exceedingly well informed, not alone in his particular province of surgery, but in the general field of medicine as well, and was ever an eager and tireless seeker after new knowledge that might render him still more useful in the practice of the healing art. United to this desire for knowledge was an endowment of untiring energy, which enabled him to prosecute with vigor whatever matter claimed his attention. While occupied with the cares of a large practice, he at all times had at heart the cause of medical education, and gave liberally of his time to further the cause, for many years.

That he was a good, earnest, practical teacher, will be gladly acknowledged by the multitude of former students, by whom he was sincerely appreciated.

Dr. Prewitt had been President of the American Surgical Association, of the Missouri State Medical Society, the St. Louis Medical Society, the St. Louis Surgical Society, and the St. Louis Obstetrical Society. He was a Fellow of the Philadelphia Academy of Surgery.

# OBSTRUCTION, PARTIAL AND COMPLETE, OF THE INTESTINAL CANAL IN INFANCY AND CHILDHOOD, CONSIDERED FROM THE CLINICAL POINT OF VIEW.\*

BY E. W. SAUNDERS, M. D.

As I have been requested to include the so-called Congenital Hypertrophic Pyloric Stenosis of Infancy in the subject-matter of this paper, I am obliged to choose a more comprehensive title than Ileus.

Within the ten minutes allotted to me I shall endeavor to achieve one result—that of calling the attention of the profession at large to a subject which has received the attention of the few. I do not presume before this august assembly to add anything to the sum of knowledge already attained by those who have been pathfinders in this realm of research, beginning as long ago as 1788, with the American Dr. Hezekiah Beardsley.

I shall not attempt to follow any one of the admirable classifications laid down by Tavel, Tuholske, Hemmeter and others, and in this bedside sketch I shall even crave your permission to make use of the almost discarded term, “Spastic Ileus.” (It is unnecessary to say that recent writers have rejected the classical limitations put upon the term Ileus, as an obstruction without inflammation, and have very properly extended it to include the cases due to an antecedent peritonitis.)

That the subject of Infantile Pyloric Stenosis has not received the attention which it deserves, except in current literature, is seen from an examination of some of the most deservedly popular text-books. One author treats of it incidentally under the head of Atonic Dilatation of the Stomach, due to rickets.

For the last quarter of a century numerous observations, clin-

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\* Read before the Section on Pediatrics, International Congress of Arts and Science, St. Louis, September 21, 1904.

ical, surgical, and anatomical, have been made, establishing the fact that non-neoplastic and non-cicatricial stenosis of the pylorus is found at all ages, except at birth and the period immediately thereafter. The majority of the specimens showed a more or less marked hypertrophy of the pyloric ring, but a minority did not, even where the symptoms during life had persisted for a long time. Some of them again were cases of true stenosis, whilst others showed redundant longitudinal folds of the mucous membrane.

Of the infantile cases it has been truly remarked that most of them were reported by a few men, showing that the profession generally has not awakened to the existence of this very dangerous disease. The course is fairly uniform and characteristic. A healthy, breast-fed or artificially fed infant, begins within the first few weeks of life to vomit, without signs of disease. Change of diet does not relieve. The vomiting becomes more pernicious, and constipation more obstinate, the stools are small and mucous, and lack true fecal odor. Rapid emaciation and exhaustion with perhaps subnormal temperature ensue. The vomiting is explosive, sometimes cumulative, and sometimes prompt, depending upon the degree of dilatation of the stomach. Bile is generally absent from the vomitus, but not always, as demonstrated in one of my cases reported, with specimen, to the American Pediatric Society.

Examination, after persistence of the symptoms for some time, reveals a pear-shaped abdomen, the intestines empty, whilst the epigastrium is full and resonant. Sometimes a thickened pyloric ring may be felt. In most cases patient and frequent observations will be rewarded by the appearance during sleep and after taking food, of peristaltic waves chasing each other from the fundus to the antrum pylori.

Whilst the tendency generally is toward a fatal termination, there may be marked remissions, as in Cantley's last case, where there was substantial gain of weight, with cessation of vomiting and normal stools, for some time after the diagnosis had been

established by palpation of the pyloric ring. The patient died in a relapse, and the necropsy confirmed the diagnosis. In Batten's case the diagnosis was likewise established by the finding of the ring. The little patient was relieved of all symptoms, and remained in good condition, until an attack of bronchopneumonia, some months later, carried her off. The post-mortem finding confirmed the diagnosis.

I have here in the city three children in whom I made the diagnosis of pyloric stenosis, who now present no symptoms of their former malady. I would be glad to have any of our distinguished visitors examine the cases and take their history.\*

Our hearts have been gladdened by a recent report from Cantley, of four cases operated upon successfully by Dent. If the whole profession can be aroused to the importance of this subject there will soon be accumulated sufficient material to demonstrate what are the most hopeful lines of procedure. We are not yet in position to judge whether gastro-enterostomy, pyloroplasty, or divulsion is the best operation, and must leave the matter entirely to the decision of the surgeons.

As to the medical treatment, the amount of food ingested is of great importance in most cases. In one of my own not more than half an ounce could be given without exciting immediate vomiting. Weaning is generally indicated. Fomentations are useful. Rectal feeding with peptonized milk is often useful as a temporary expedient. Batten's method of feeding through a tube is rational, and should be used more systematically. Peptonized milk and whey have given me the best results in feeding. Olive oil, occasionally, has seemed to be beneficial. Atropine, chloral, condurango, and anaesthesin may be tried in turn. In one case morphine was given with great benefit. In estimating the effect of diet and medication, account must be taken of the natural

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\* The presentation of these three cases at this meeting was impossible.



tendency to intermittency of the severer symptoms, even where a massive pyloric ring can be felt.

As to the pathogenesis of the disease I have no theory to offer, only the suggestion that as the condition has not been demonstrated in the stillborn, the term congenital may after all be incorrect. The rapid growth of the normal stomach during the first six weeks of life might afford grounds for the supposition that the muscular hypertrophy of the pyloric ring could take place after birth. Certainly there is a varying degree of pylorospasm throughout the history of those cases, which do not run a rapid course to a fatal termination. The theory that hypertrophy cannot be caused by a tonic spasm of a sphincter muscle, falls to the ground, for the reason that the spasm is eminently intermittent, as proven by clinical observation. Batten's experience would go to prove that feeding through a tube is efficacious, because it avoids the physiological stimulus to closure of the pylorus.

#### ILEUS.

That this subject is germane to that of Infantile Pyloric Stenosis is well illustrated by an instance of a case of the latter, in which two thoroughly competent physicians made the diagnosis of Ileus, because of the presence of bile in the vomit.

There are several peculiarities to be remembered in approaching the differential diagnosis of this condition in infants. The deceptive stage of anesthesia is very quickly reached, whether it be a case of general peritonitis, or of strangulation. The parietic form of Ileus is very readily induced, so that the surgeon dreads to invade the peritoneum, and especially to handle the intestines. The infant, unlike older children, is not deterred by pain from screaming incessantly for hours after the onset of an acute obstruction — there is no sign of intermittency in the spasm. Given a screaming baby with a history of vomiting and constipation with retention of gas, the first thing to do is to give chloroform and make a thorough exploration of the abdomen, not omitting a rectal

examination. At the same time the rectal temperature should be taken. The chest should be examined also. The hernial openings, the testicles, the bladder, should not be overlooked. The urine should be sought for. In the vast majority of cases, with a history of agonizing and incessant pain, coming on in the midst of health, perhaps during sleep, the cause will be found to be an intussusception, generally of the ileo-cecal or ileo-colic variety. If it be too early in the case to furnish a history of repeated vomiting and of constipation, or a discharge of bloody mucus, the cause may be found to be an otitis or a lithiasis. Within a few weeks an infant in my practice passed through three painful attacks. The first was an otitis, the second a lithiasis, and the third an intussusception, from which she died in spite of operation.

The infantile cases never present the evidence of rhythmical pains, whereas the juvenile cases may manifest a paroxysmal character from the first. Such cases may undergo spontaneous resolution under the use of atropine, opium and fomentations; but such an event is certainly rare in babies. In fact, many cases of juvenile colic are, no doubt, in reality mild cases of invagination, tending to resolution.

In making a diagnosis too much stress should not be laid upon the necessity of finding a tumor, and in considering the advisability of an operation, no heed should be paid to deceptive appearances of amendment — the passing of a little gas, or the recovery of a little fecal matter by colon washing, or the cessation of vomiting for a considerable period of time. After examination under chloroform, if the case be of recent origin, recourse should be had at once to irrigation or inflation, with a view of reducing the intussusception, if such be the diagnosis. Failing in this a surgeon should be summoned.

Deplorably bad as are the results of operation in infancy, they will be undoubtedly better when intervention is practiced at an earlier stage of the disease. I have seen one case of recurrent invagination due to polypoid growths in the small intestine.

During the several months of her sojourn in hospital, the girl passed through a number of attacks, in all of which the sausage-shaped tumor could be felt. In the last attack there was no tendency to resolution, and a prompt operation, done by Dixon, saved the child's life. A chronic case in a young child came under my care after six physicians had treated it without apparently suspecting the diagnosis. This case was successfully operated upon by Dixon. A year later the invagination returned, and was again operated upon. The second time a reef was taken in the mesentery, and Dixon reports the child as well after the lapse of several years.

In making the particular diagnosis of Ileus in young children, we have not to traverse as wide a field as in adults, but there are quite a number of deceptive conditions to be borne in mind. In the newly born atresia of the pylorus, the duodenum, the ileum, and the rectum soon give rise to symptoms of obstruction. Herniae, so common in early childhood, are liable to the same accidents as in later life. There is a form of peritonism which no doubt we have all seen, produced by prolonged crying in infants with umbilical or inguinal hernia. There is no incarceration and no peritonitis, but meteorism, constipation and great tenderness of the abdomen, lasting for some time and requiring the use of opiates.

A strangulated, or even an incarcerated, ovary or testicle, may give rise to all the symptoms of Ileus, and so may a calculus, arrested in the ureter. A blow upon the abdomen may give rise to a fatal parietic or spastic Ileus, or may cause death by rupture of the intestines. In all cases of traumatism surgical counsel should be sought immediately upon the appearance of the slightest symptoms. Filatov describes cases of Gymnastic Myositis of such severity as to simulate an acute intra-abdominal disease. Crozer Griffith has well described the great difficulties in the way of diagnosis between pneumonia and pleurisy on the one hand and of infra-diaphragmatic inflammation on the other. In diaphrag-

matic pleurisy there may also be a transmission of the infection through the diaphragm, whilst in pneumonia intestinal paresis is one of the gravest of symptoms.

Cyclic vomiting, associated with acetonæmia, offers no serious difficulty in the differential diagnosis.

Foreign bodies, parasites and coprostasis are rare but possible causes of mechanical Ileus in young children. Overfeeding is not put down as a cause of acute paralytic Ileus in young children, although it certainly is in adults. No doubt the reason is that children die of convulsions or auto-intoxication before there is time to develop intestinal paresis.

Embolism of the mesenteric artery in subjects afflicted with heart disease, should not be overlooked as a possible cause of paralytic Ileus, with hemorrhagic stools. Idiopathic dilatation of the colon gives rise to a chronic enormous distention of the abdomen, with constipation and vomiting.

We cannot afford to part with the term Spastic Ileus so long as we meet with cases like the following: A young infant began screaming and vomiting in the afternoon, and continued to do so without intermission until the evening of the following day. No stool or gas passed. I then administered chloroform, and examined the abdomen by the rectum. There was no meteorism, nothing abnormal discovered. After the narcosis gas and faeces passed, the vomiting and pain did not recur for some time, and then to a slight degree. If there had been an invagination, lasting thirty hours under the pressure of incessant screaming, the return to a safe and normal condition at once would not have been possible.

Lead is the most potent agent for the production of Spastic Ileus and we are told that veratrum and eserine are also capable of producing it.

Cerebral vomiting, with obstinate constipation, may be confounded with Ileus, but a careful examination should in every case clear up the diagnosis.

It remains to consider the relation of acute peritonitis, general or local, to Ileus. In their onset they are often indistinguishable, and in their final stage they are absolutely so. The temperature may greatly assist in the diagnosis, but it is a fallacious guide. In a recent case of intussusception I found the temperature 102° F. twelve hours after the onset. On the other hand, a case of beginning appendicitis may show a temperature of 99° F., and the same may be true of a case in which the abdomen is full of pus. In both diseases the pain, if the patient be old enough to indicate it, is at the beginning apt to be referred to the umbilical region, but later a local tenderness and resistance may be made out, which will furnish a clue to the probable nature of the trouble. Narcosis should be employed without hesitation to facilitate the search for a tumor. If the bloody mucus, characteristic of intussusception, has not appeared, a colon washing may afford evidence of it, or may demonstrate that there is no obstruction.

It is urgently demanded that a speedy diagnosis be made in every case where a healthy infant is seized with agonizing pain, causing incessant screaming. The crying aggravates the condition, if there be any trouble in the abdomen, and calls for an anaesthetic or an opiate. Strangulation symptoms may be added to those of obstruction in a very short time, and even if the nature of the lesion is such as to give no occasion for necrosis of tissue, yet within six hours an obstructed intestine becomes permeable to bacteria, whilst the toxins formed from its contents possess a singular virulence.

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## CLASS-WORK IN PRACTICAL ANATOMY.

BY R. J. TERRY, M. D.

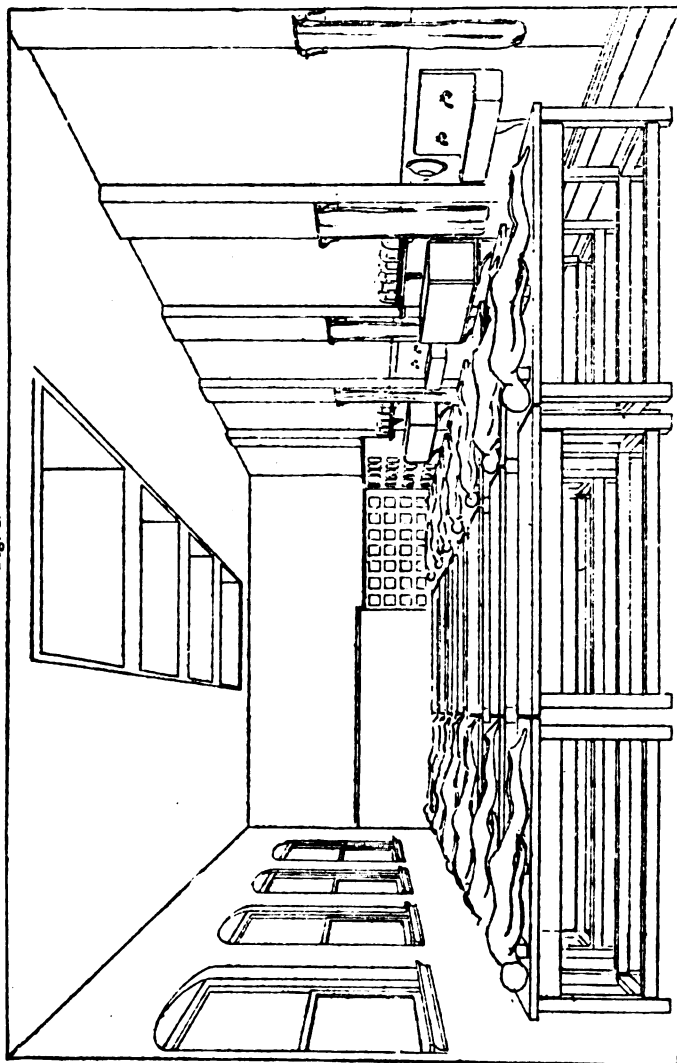
It is traditional among students of medicine that of all studies in the curriculum anatomy is the most difficult to acquire. We are accustomed to the objections made year in and year out to spending so much time upon a subject so soon forgotten, and meet the objection with the reminder that anatomical facts find their greatest use during the course of study. Nevertheless it must be admitted that anatomy is hard to hold even for so short a time as four years.

It is to be feared that we have settled down to the conviction that it is the subject-matter entirely which is to blame, and the attitude is not unwarranted since this venerable study has been handled by the masters of medicine and a precision attained in the demonstration of structure and an economy of material secured which are surpassed in scarcely any other laboratory.

Without doubt the main difficulty is in remembering the mass of details, and it is quite possible that this results not altogether from the number of facts to commit to memory, but largely from the manner in which the subject is presented.

There can be no real understanding of the history of a nation unless the study involves to some extent the history of sister nations; the study of a language means nothing when the work does not include a consideration of the literature; chemistry must be carried along with physiology. There must indeed be a grouping for mutual support and understanding of subjects that are akin. This has not been carried out well for human anatomy, and although a high degree of perfection in demonstration

Fig. 1.



A number of entire bodies sufficient for the class is placed face downward upon the tables. All members of the class begin work on the gutta region. The lower limb is taken in preference to the upper since it is easier to dissect and because it is desirable to remove its masses of muscle from the room as soon as possible.

has been secured, almost no effort has been put forth to fasten together the artificially separated branches of the science.

Almost complete isolation from the rest of the subject has been made of one aspect of a natural physiological division of the body. Called "osteology" it is treated as one of the several units to be taken up, brutally committed to memory and dropped with the passing of an examination. Under the system handed down to us we must learn form and relations of a given organ in the dissecting room and carry the impressions buried under and confused with ideas of different organs studied in succeeding days until, often only after a remote period, it is again presented for the consideration of its fine structure. So far are these artificial divisions of the subject removed from one another that it has become a habit to speak of "anatomy" and "osteology," and of histology and embryology as if they had no bearing on structure. It is much like speaking of "man and animals."

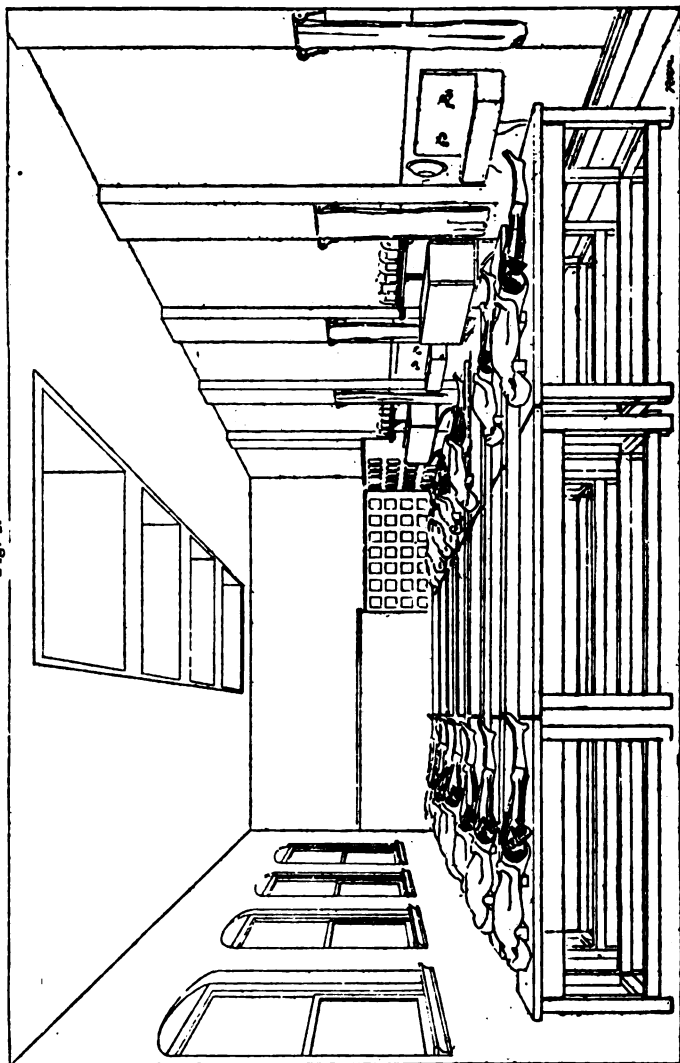
It is well known of course how this has come about; how osteology and microscopical anatomy and embryology and dissecting each began and grew as a special study. But it is a detriment to learning anatomy to keep them apart and to have to depend upon the memory for a long time before the facts are all collected for correlation. Certainly it is time to reconstruct the anatomy course along another line.

Correlation of the hitherto isolated divisions of anatomy is hardly possible so long as the work in the dissecting room remains as it is. The prevalent system for examining the human body is one the like of which does not exist in other laboratories where class work is done. Sections of the same class are put to work on different parts of the body and there is in the end no community of results further than a knowledge of the features in general of nerves, muscles, fascia, etc. A section of the class has demonstrated and tried to remember the structure of an isolated part of the body studied from one point of view.

Let us contemplate the anatomical work of a single student



Fig. 2.



When the gluteal region, popliteal space and back of the thigh have been dissected, the bodies are turned and the front and inner side of the thigh is studied. Finally the hip joint is examined and the lower limb removed from the trunk.

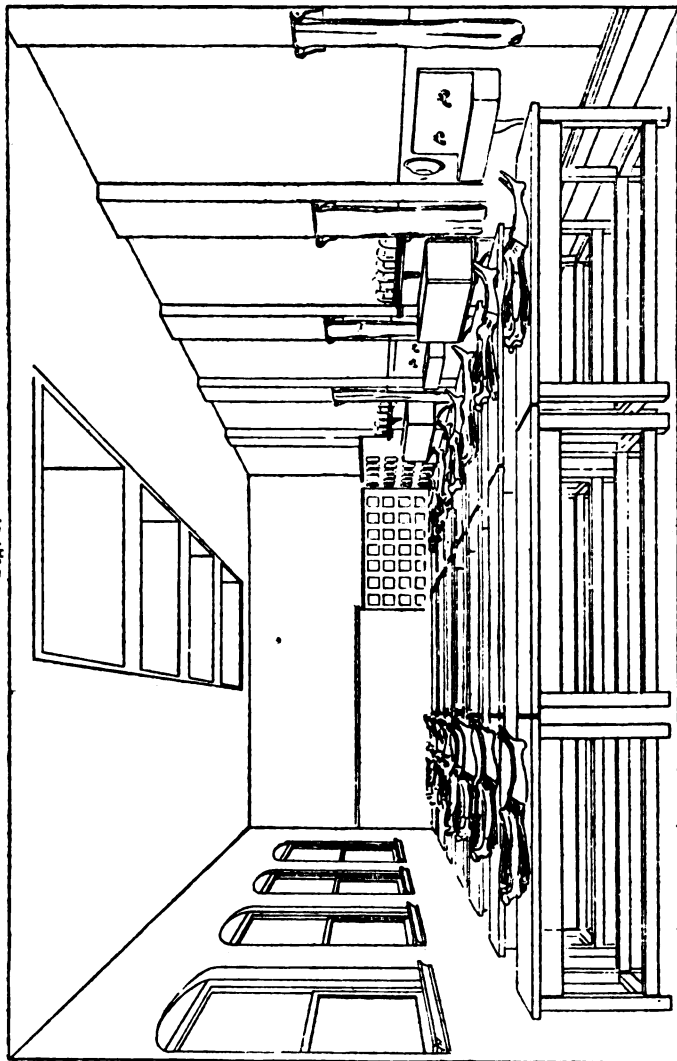
at some moment in the year. He is one of a class in histology engaged in the study of the connective tissues. At some other time of day he is dissecting the upper limb, exposing the structure and committing to memory the names, relations and other desiderata of all parts of that member. The course in embryology has not begun. A part of the time is spent by the student at a demonstration of one of the cranial bones; he will be quizzed upon this at the end of the week. Finally he is attending some lectures in anatomy; the topic at present is the adductor muscles of the thigh.

This little picture is not overdrawn; we have all taken part in it. Looked at fairly is there not shown to us a condition outside the intrinsic difficulties of anatomy which adds much to the student's labors and perplexities? Is it not remarkable in view of such a tangle of topics that anyone learns anything about the subject in the short time given to it?

So long as anatomy is presented without order or sequence of its parts so long will there be no possibility of correlation; and until the several sides of the subject be brought harmoniously together, but few students will go away with a true knowledge of structure.

If there could be introduced into the dissecting room the ordinary system of the microscopical laboratory not only would it be possible to bring together and carry on at one time the different studies of any natural division of the body but the economy of time, of material and labor would be immense. Addressed to students all working upon the same subject the lecture would be of the greatest help and call forth an interest that has been lacking for a long time in the lecture hall. Think how easily the work of a class could be controlled as the study progresses day by day, the same for all. And records and the assignment of material and examinations — how simple these would become for the man in charge! How much would be gained by the opportunity of studying a series of dissections, and how much better would a

Fig. 8.



The trunks are stored in the tanks along the wall where they are kept moist by a carbolic solution. The rest of the lower limb is studied, and when finished the bones are taken from the room.

part be understood when the whole class is thinking about it and discussing it — clearing it up for some, giving new ideas to others.

Granted that a system which permits of correlation of its parts is better than one which affords no such possibility or hardly any, the question arises, can such a system be applied to anatomy generally. Is not the nature of the material used in the dissecting room a sufficient obstacle to preclude a laboratory method like that in histology? It was, but it need not be so now. Material can be preserved indefinitely and the dissection carried on as leisurely as one could wish.

We dare advocate the introduction of a system for the teaching of human anatomy which shall be more orderly and provide for the fastening together of its parts so that their meaning may be better understood and which shall better economize time and energy.

Our confidence in the application and success of such a system rests on an experience with it now of four years. The idea was first given notice in a former number of the BULLETIN embodied in our then one-year anatomy course.\* Since then a number of changes have occurred in the curriculum which have made it possible to carry farther the original conception. It is still far from perfect in its workings but we see no serious difficulty to overcoming the obstacles that at present hinder the elaboration of the method.

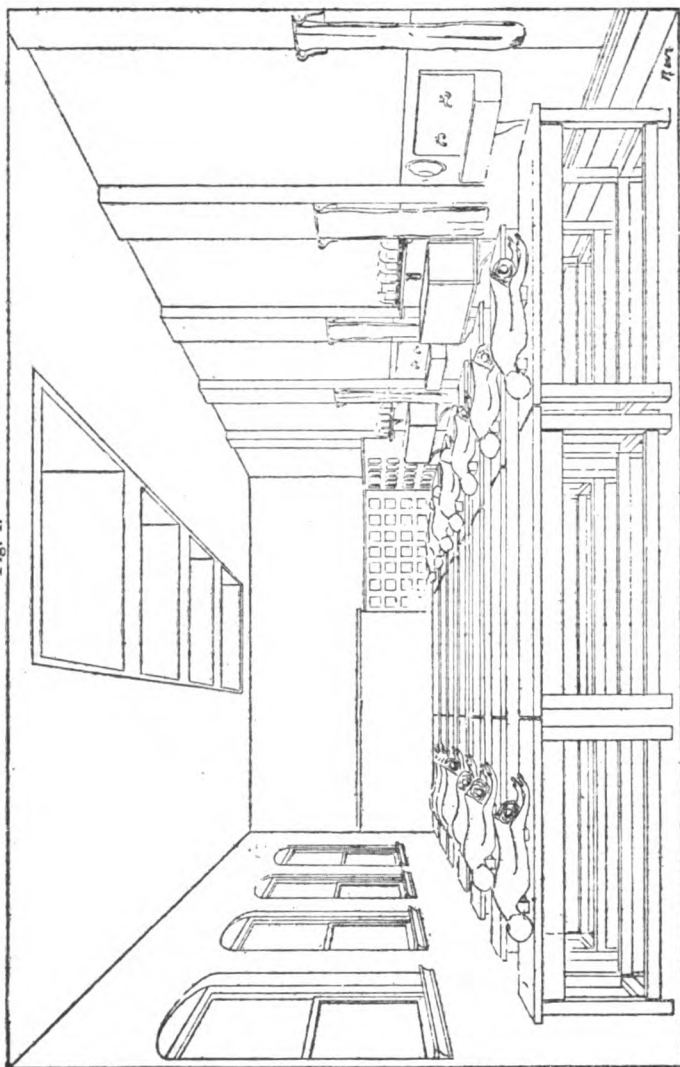
In the description following, the order of work will first be indicated, then the possibilities of correlation.

ORDER OF WORK. — Since the success of the system rests upon the order of subjects taken up by the class as a whole, it is at once necessary to have some guide which shall keep the members of the class working abreast. The guide must be carefully prepared so that plenty of time be allowed for the completion of

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\* A One-Year Anatomical Course: Its Arrangement, Merits and Disadvantages. Medical Bulletin of Washington University, Vol. I, p. 2.

Fig. 4.



The trunks are taken from the tanks and placed on the tables which they formerly occupied. Dissection of the upper limb begins with the muscles and other structures connecting trunk and limb. When these have been demonstrated, the limb is removed by an interscapulo-thoracic amputation and left on the table; the trunk is again stored.



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each item of work. A part of our programme is shown above. The amount of dissection to be done each day is indicated as a certain number of pages in a standard manual of anatomy and in most cases this is a study of some region or of associated organs; naturally the amount of work will vary somewhat day by day according to the difficulty or extent of the part to be prepared. Students must, of course, use the same dissecting manual, but since it is a guide for finding structures rather than an authority for reference we feel that there is no infringement on the students' freedom in this practical work. As a matter of fact atlases and text-books are commonly brought along for comparison and study.

The purpose of the programme, therefore, is to keep the class at work on a certain part day after day until the body is finished.

As the material is to be used a long time it must be well embalmed, and, where it is possible, the best bodies only should be placed on the tables.

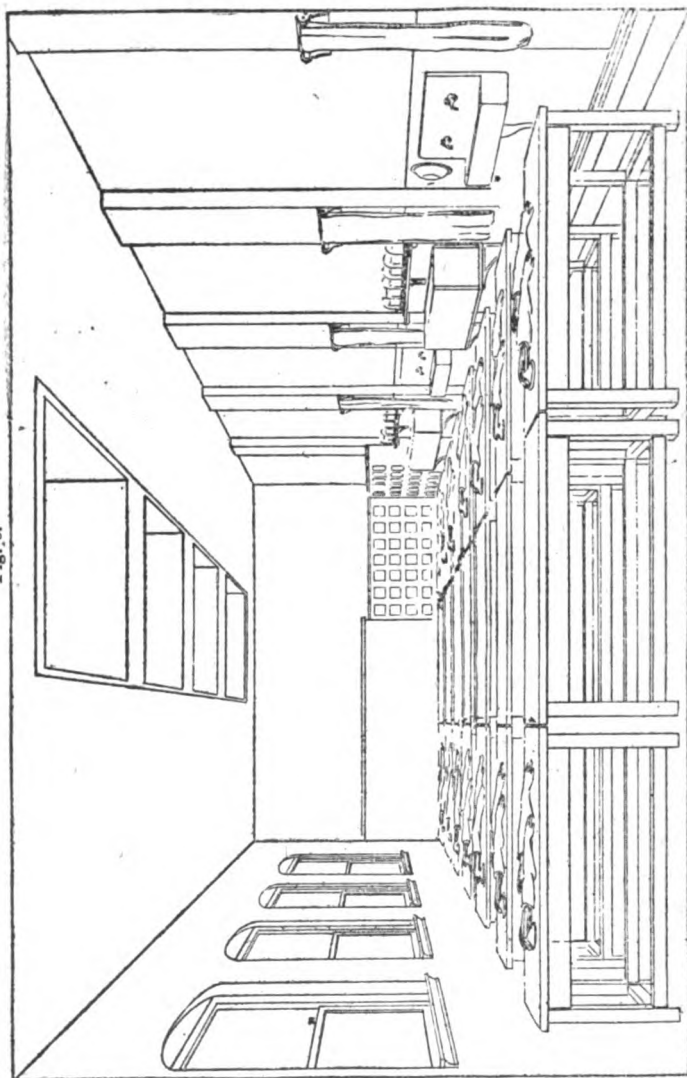
In the usual manner the class is subdivided into groups for each body. These need not be of more than five men; according to the work which alternates daily, we have two dissectors, two readers and a recorder, that is, two for each side of the body and one to keep a record of all that is found. Even here at the outset there is an advantage by having only a few students working on a body instead of eight or ten or more where the crowding and irrelevant conversation stand in the way of good work.

A group remains at the same body from beginning to end, an arrangement which increases the interest of the dissectors as the work progresses.

The order of dissection and the methods used in exposing the structures in any of the usual subdivisions of the body are those given in the best American and English dissecting guides. In some cases we have found it convenient to change the order, as, for example, with the pelvis. It is unnecessary, therefore, to re-



Fig. 5.



Work on the shoulder, arm, forearm and hand is done after the upper limb has been detached from the trunk. When finished the bones are removed from the room.

peat the steps over which the class goes except in a few instances. The essential features of the order of work can be understood by referring to the figures with their legends and to the programme.

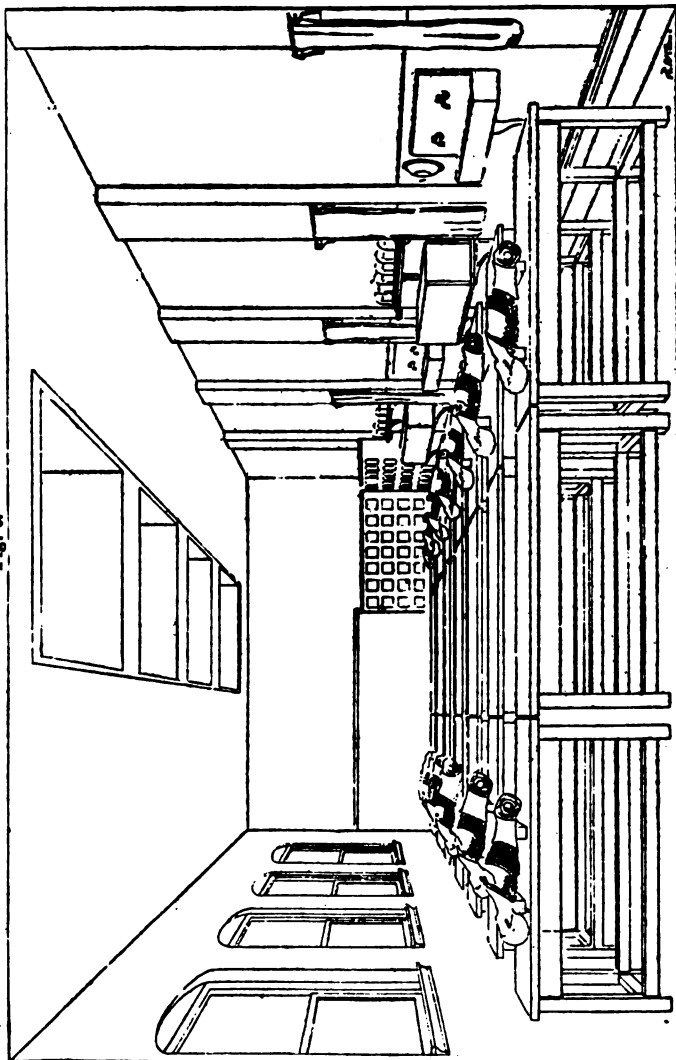
Dissection of the limbs has to precede that of the trunk in order to avoid the mutilation of parts or interruptions to the work which would otherwise occur when the thoracic and pelvic regions are encountered. It would be more logical to study axial parts first but unfortunately this seems impracticable.

It will be noticed that the plan is followed of removing the limbs and completing their dissection free of the trunk which is in the meantime stored away in one of the large tanks in the room. The freedom enjoyed by the dissector to move the detached limb to suit his convenience in working and the relief from being in close community with others in his group are much appreciated. As the trunks are put away in closed boxes, the room is really rid of them and the atmosphere is correspondingly improved; the tables and drain-buckets are more easily cared for and altogether several conditions for more comfortable work are established with this simple procedure.

No new bodies are brought into the room until the first series has been finished. As dissection goes on, the waste material is day by day taken from the room and when dissection of a whole division of the body has been brought to an end nothing remains but the bones; these are removed to the macerating room. Thus little by little the material in the room decreases in amount and at the termination of the work on a body there remain only a few fragments of the skull. The odors and other disagreeable accompaniments of the work which are greatest in the first few weeks steadily decrease to the end.

Dissection according to a daily programme of one and the same piece of work for every member of the class affords, as already alluded to, an opportunity for studying a series of regions or structures; to note and be impressed with their resemblances or

Fig. 6.



The limbs having been finished and removed, the dissection of the trunk is undertaken. After the chest wall is studied the cavity is opened by the method of Prof. Sir William Turner, and the viscera studied.

identity of arrangement; to discover some variation or to look about for a chance to see and study nerve or vessel which by accident has been damaged or destroyed in one's own dissection.

The study of series of dissections has positively demonstrated the superiority of learning by seeing the things themselves over text-book descriptions and even figures. The instructor soon discovers that for most of the body a review of the description to refresh his memory becomes unnecessary; it is only those parts which he has never seen well displayed that he must read about over and over again. It has been noticed, too, that variable parts are difficult to learn: students do not readily remember the origin and course of the external circumflex artery of the thigh, or the transversalis colli. In connection with the study of series should be mentioned the interest which surgeons have taken in seizing the opportunity for the review of certain regions.

**CORRELATION.**—Two series of bodies are dissected by one class.

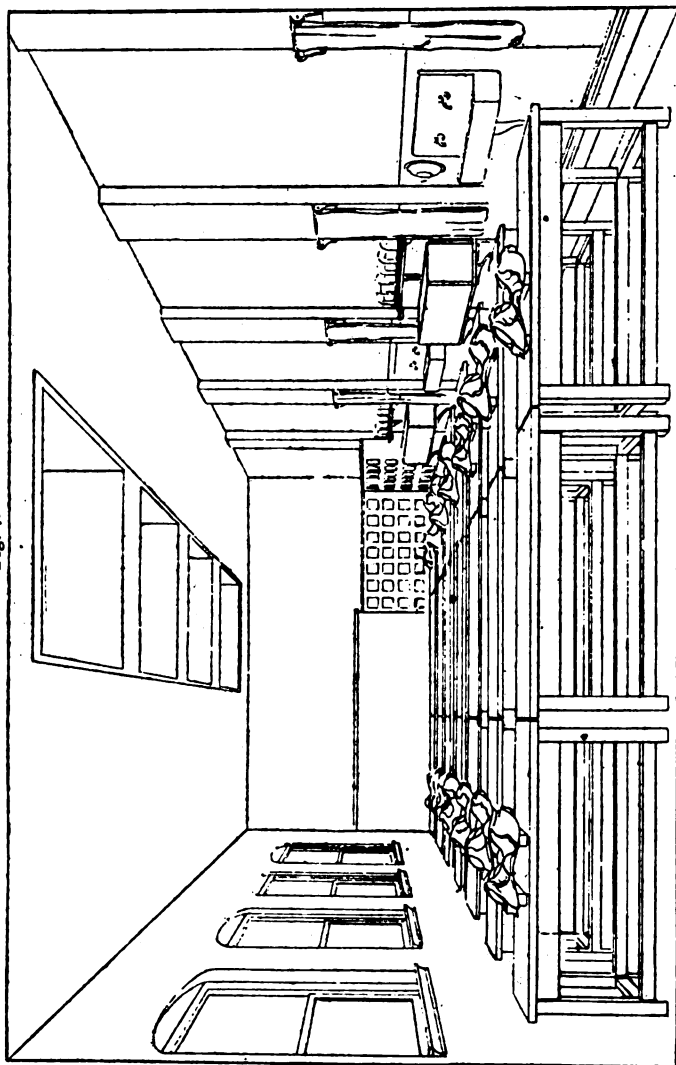
In the first series the attention of the class is directed to the study of the locomotory apparatus, and the work extends through the greater part of the first semester, about three months in all. During the second and third semesters the class is engaged in the dissection of all structures in the second series of bodies.

We begin with the locomotory apparatus because it is composed in great part of fixed structures, large and easy to learn; and because the bones and muscles offer the best means for limiting regions and locating vessels and nerves.

Dissection of muscles and joints is part only of the work on the locomotory apparatus; the other part is done in the bone modeling room. One cannot understand the muscles and joints unless he knows the bones; and one cannot know the bones unless he understands the muscles and joints. That is to say, as these parts are mutually dependent they should be studied reciprocally.

So the class prepares the muscles and joints in the dissecting room and reproduces the forms of the bones in clay in the model-

Fig. 7.



Dissection of the abdomen. The chest is divided at the level of the 4th thoracic disc and the head, neck and adjoining part of thorax are stored. The abdominal walls and viscera are examined. An admirable view of the diaphragm can be obtained in the abdomen as it now presents itself.

ing room; they do not study osteology by observation of dry bones, or myology by what can be displayed with the scalpel, but the men try to learn by combined methods the forms and relations of the parts concerned in a physiological division of the body.

Most of us learned the skeleton as a child learns to speak, but with this difference: we wanted to know the wherefore. We memorized scores of osteological riddles and forgot the questions often long before the time arrived when they could be answered. But with this simple and practicable correlation, questions arise and answers can almost immediately be found, for parallelism of work in the two laboratories can be easily secured: dissection of the thigh and modeling of the femur; preparation of the joints and muscles of the foot along with the reproduction of the form of the foot-skeleton in clay.

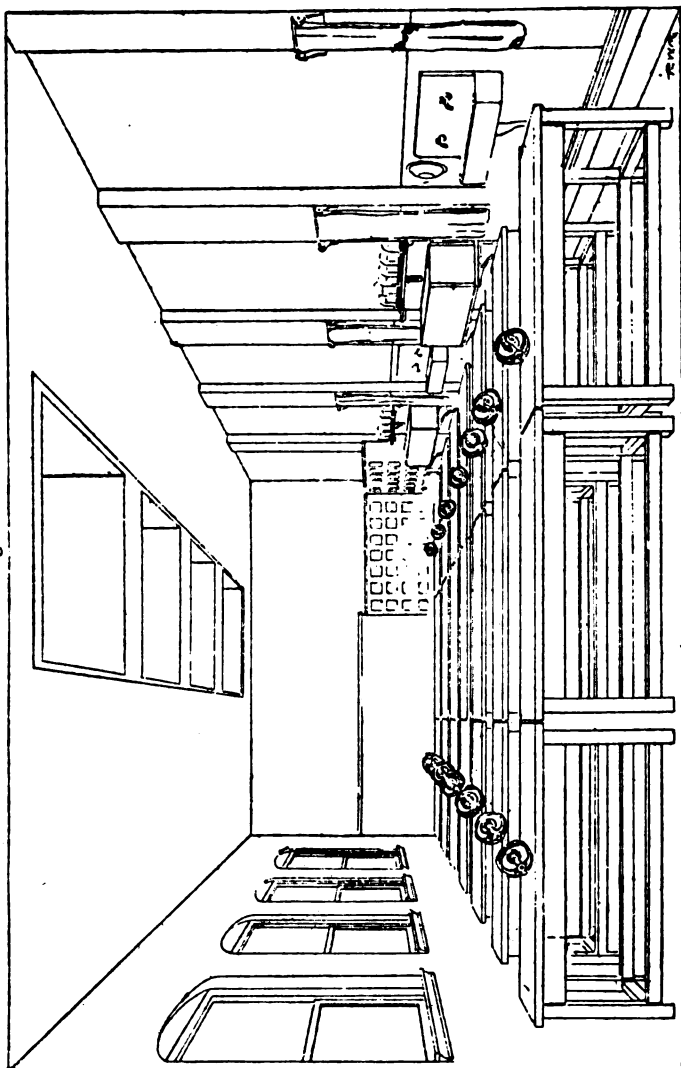
How well the bones can be reproduced in the modeling room could be answered by any kindergarten teacher as well as by all who have tried the admirable study-method advocated by Dr. Flint.

The anatomy of the locomotory apparatus does not of course end with the naked-eye study in these two laboratories. During part of the same period the class work in histology concerns muscle and supporting tissues, the structure of bone and of the parts which enter into the formation of joints. At the same time the mesoderm and its skeletal derivatives are considered and the development and growth of bone form part of the topics of the first semester's work in embryology.

A lecture a week on the gross anatomy of the locomotory system and a few on the development and fine structure of the parts involved help to fasten together the different aspects of the subject. This is well brought about by explaining the parts through their mechanical obligations after the manner of H. von Meyer from whose admirable work a full set of dissections has been copied.

This illustration should be sufficient to show that correlation is possible when the work in the dissecting room is done in an orderly

Fig. 8.



The pelvis is separated from the abdomen proper by a cut at the level of the 14 lumbar disc. Dissection of the pelvis consists of (1) from above (2) the perineum (3) from the side, the "*Zusammenfassung*."

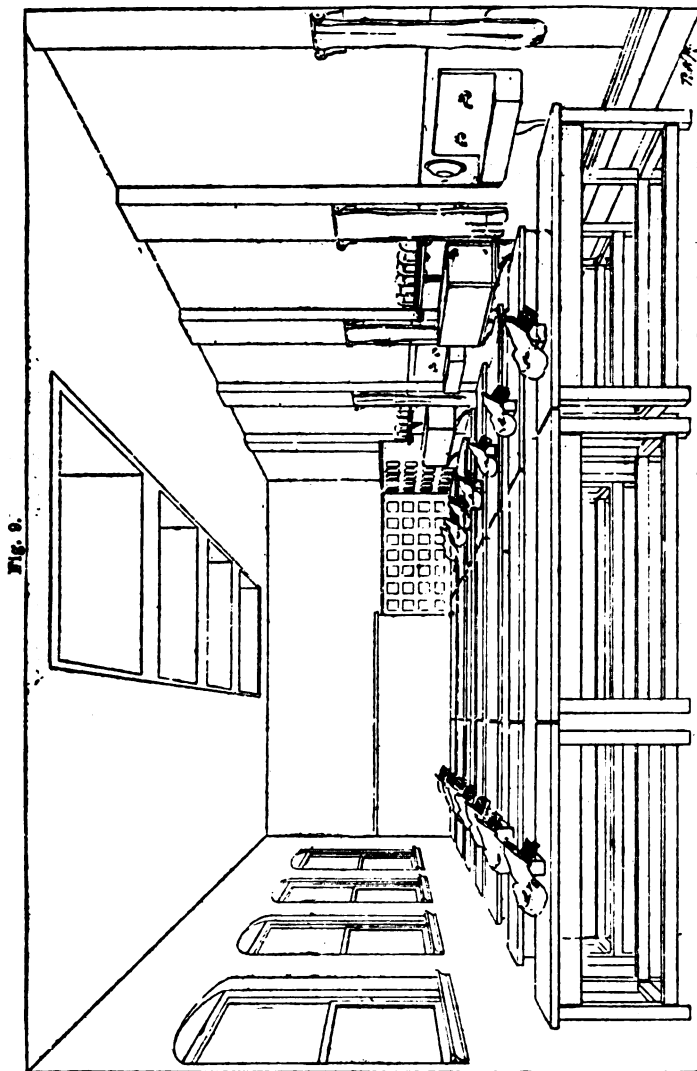


Fig. 9.

Head. All parts but the head have been dissected and taken from the room. Notice that no new material has been brought upon the tables. The brains were removed soon after embalming, and have been saved for the work in neurology. In the last dissection (Meckel's ganglion), only a fragment of the body remains.



way. In the second semester the study of the vegetative organs is carried on simultaneously in the dissecting room and the microscopical laboratory by the whole class and the work is controlled by a conference. Finally, the dissection of the head and neck in the second year including as it does all parts essential to the understanding of the nervous system is accompanied by the microscopical work in this line.

While interest in human anatomy is stimulated by the appearance of new and beautiful descriptive works and atlases the difficulties in the way of learning it will never be materially lessened until better order is brought into the dissecting room; and it cannot be expected that more than a few in every class will understand the subject until all of its parts are rationally brought together.

## DIETETIC TREATMENT OF SIMPLE CONSTIPATION.

BY WILLIAM H. RUSH, M. D.

The treatment of constipation by means of dietetics is not new, yet the number of people of all ages and of all the walks of life who suffer from this abominable condition indicates that the subject receives less attention from physicians than it should. Dietetic treatment does not mean a tiresome and monotonous régime of a limited number of articles of food, but it means a carefully selected dietary suited to the particular needs of the patient in question. The subject is fully discussed in the special works on the diseases of the intestines, and I shall therefore mention but briefly some of the general principles on which the treatment is based and shall trust to the report of a few cases to illustrate the application of the method.

In treating constipation, one aim is to produce a large and abundant stool. This is accomplished by giving the patient a preponderance of vegetable foods which will furnish a large residuum of non-digestible material in the intestine. Foods of this class are spinach, cauliflower, asparagus, Brussels sprouts, lettuce, celery and cabbage (the latter should be finely cut and parboiled), all of which are relatively poor in nutritive materials, and contain a large amount of cellulose, lignin and cutin. Very effective also are fruits, such as apples, pears, plums and peaches, either raw or cooked. Somewhat less useful are green peas, green beans, carrots, beets, oyster plant and tomatoes. The more highly nutritious vegetable foods, such as potatoes, rice, beans, etc., should be eaten but sparingly, or not at all. Graham bread, Boston brown bread and "pumpernickel" should take the place of white bread,

and if a breakfast food is desired it should be oatmeal or Graham porridge instead of the delicate wheat products.

Certain other articles, either of themselves or through their decomposition products in the intestine, act in a mildly laxative manner by stimulating intestinal peristalsis. Such articles are the sugars, especially glucose (honey!) and milk sugar, the fats, the inorganic salts and the organic acids. Preserved fruits like figs, prunes, dates and raisins are therefore of use not only on account of the cellulose, but also because of the large amount of sugar which they contain. Butter, cream and olive oil should be used liberally, and meats containing a good deal of fat should be preferred to lean. Salted and preserved meats and fish have to a certain degree an advantage over the same articles in the fresh condition.

Buttermilk is a useful addition to the solid dietary in some cases, as is also beer. Coffee stimulates mildly intestinal peristalsis, tea and cocoa on the contrary are constipating. If wine is desired it should be a sherry, white Rhine wine or Moselle and not a claret or other red wine containing tannic acid. A drink of simple cold water stimulates intestinal peristalsis, especially if taken on an empty stomach.

In prescribing a dietary due consideration must be given to the patient's tastes, idiosyncrasies and circumstances as well as to the severity of the condition to be combatted. Where there are any symptoms pointing to a derangement of the stomach, the latter should be examined, and the dietary planned to meet the requirements of both stomach and intestine. The dietary should be as full and varied as the means of the patient will allow; it should be explained in detail and given to him in writing, often with instructions as to how certain articles of food are to be prepared. It is rarely difficult to enforce a dietetic régime, even in dispensary practice, for most patients have already tried medicines until they are convinced that medicines will do them no permanent good.

The most instructive and satisfactory cases are those treated by dietetics alone, and most cases can be successfully treated in this way. There are others, however, where the accompanying symptoms are distressing, in which it is better to use for a few days some additional means of moving the bowels, in order to secure immediate relief. For this purpose we may use any mild laxative internally, or better, though it is more inconvenient, the enema proposed by Fleiner, of one-half pint of olive oil (sweet oil is a good substitute), or the oil emulsion of\* Boas. Either of these (the latter has the advantage of greater cleanliness) introduced slowly at body temperature on retiring, should be retained until morning, and will induce a more complete emptying of the bowel than the ordinary laxative enema.

As a sample dietary, for a case of moderate severity, with a normal stomach, may be submitted the following:—

On arising, a glass of cold water, drunk slowly.

Breakfast: A raw apple or other fruit.

Cup of coffee with sugar and cream.

Graham bread, abundant butter and honey.

Meat, moderate amount, or two eggs.

[Potatoes, cakes, etc., if fuller breakfast is desired].

Luncheon: Glass of water.

Graham bread and butter.

Meat, small amount.

Asparagus, green peas, celery or stewed fruit.

A salad, with oil dressing.

Dinner: Glass of water.

Graham bread and butter.

Meat as desired.

Spinach, cauliflower, Brussels sprouts or cabbage.

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\* Sodium carbonate, a piece the size of a bean, cod-liver oil and castor oil each 1 oz., water, one-half pint. Dissolve the sodium carbonate in the water, add the oil, and shake. Diseases of the Intestines. Translation, p. 179.

Green peas, green beans, stewed onions or carrots.

Dessert and coffee, according to taste.

In a case of extreme severity the above may be re-enforced by a pint of buttermilk or beer during the day, or by a tablespoonful or two of sugar of milk which may be taken in coffee, or by a few figs, dates, raisins or an apple at bed-time.

CASE 1. Sister D., 19 years. From early childhood obstinately constipated. For several years has had no spontaneous bowel movement, and has often gone 3 days without a stool. Is much troubled with languor, headache and faintness. Laxatives and purgatives in increasing doses without permanent effect.

Chest normal. Urine free from albumin, sugar and casts. Stool hard, no mucus nor blood. Treatment, anti-constipation diet, oil enemata each evening for one week. No laxatives internally. Stools daily from the beginning, rapid disappearance of subjective disturbances. Six months later the patient was adhering to her diet, felt herself in perfect health, stools spontaneous daily.

CASE 2. Schoolgirl, 12 years. Father was habitually constipated and died from a perforating duodenal ulcer. Patient well grown, robust, ruddy, athletic, and has enjoyed for the most part excellent health. At intervals of a few weeks, however, there have been attacks of languor, headache, colicky pains in the abdomen, sometimes vomiting. Bowels constipated from infancy. Injections and laxatives had been used until parents despaired of a cure, and finally six years previously all treatment had been abandoned. Since that time bowels had moved not oftener than once in two days. Intensification of the constipation has led to the above described attacks.

Inquiry into the child's habits revealed two important facts: first, that she had an excessive liking for meats, of which she ate a great deal, and second, that her customary time for going to stool was just *before* the evening meal. She was put upon a diet as strict as her somewhat obstinate tastes would tolerate, was given

each day for five days a mildly laxative pill, and was instructed to wait upon her bowels punctually each day *after* a meal, preferably breakfast. For six weeks the stools were daily, when there came a slight relapse. Again the laxative pill was given for five days, and more strenuous efforts were put forth to induce the child to eat a diet rich in cellulose. The bowels at once became regular, and had continued so when the patient was heard from one year later. There had been no return of the headache, colic, etc.

CASE 3. Mrs. M., 58 years old, a teacher. Family history good. Has had the usual diseases of childhood, pneumonia, and frequent attacks of influenza.

For 6 years the patient has had at intervals of a few weeks attacks of so-called "biliousness," during which she suffers from loss of appetite, nausea, coated tongue, weakness and drowsiness. Rarely there is vomiting. The skin at such times is said to be yellowish, stools light-colored, urine dark. The attacks are always introduced by a peculiar paraesthesia, a thrill or tingling sensation in the scalp over the left side of the head, and in a vertical line along the anterior part of the right thigh. At the close of the attacks there are a few days of diarrhoea, with frequent spasms of the sphincter, accompanied by a distressing and sickening pain. Bowels usually obstinately constipated. Often while at stool there are sudden sharp colicky pains in the abdomen.

Lungs and heart normal. Tenderness over the transverse and descending colon.

Urine free from albumin, sugar, bile and casts.

Stomach empty in the morning after an ordinary evening meal. Test breakfast of toast and tea removed in one hour, 50 cc. obtained, well digested. Free hydrochloric acid 1.3%, total acid, 2.1%. No mucus, no abnormal microscopic constituents.

Stool hard, lumpy, free from mucus, blood and pus.

Strict anti-constipation diet with considerable fruit, fresh

and preserved. No medication. Oil enemata for three evenings. After two or three weeks of slight irregularity, with 1-3, usually small, evacuations daily, the stools became regular and have continued so for one year. There has been no repetition of any of the disagreeable symptoms above described.

CASE 4. Mr. D., 58 years old, a farmer, served four years in the Civil War, has been a hard worker and a man of regular habits. For twenty-five years has suffered from digestive disturbances and constipation. Appetite fair. Has a feeling of pressure and heaviness in the stomach, beginning  $\frac{1}{2}$  hour after eating and lasting 2-3 hours, worse after the principal meal of the day. Frequent belching of gas after meals, and occasional vomiting. At times there are colicky pains in the abdomen with flatulence. Bowels obstinately constipated, going at times 5 days without a movement. Feeling of lassitude, with frequent headache. For three months has been living almost exclusively upon bread and milk. Cathartics have been used in great variety and in increasing doses without permanent relief.

Tongue is coated, flesh flabby, radials moderately sclerotic. Lungs normal, slight impurity in first heart-sound at apex. In abdomen no abnormal resistance and no tenderness.

Urine, free from albumin, sugar and casts.

Stomach empty in the morning. Test breakfast of toast and tea, expressed in 1 hour, 80 cc. recovered, poorly digested. No free hydrochloric acid, no lactic acid, no mucus and no abnormal microscopic constituents.

Stool, hard, lumpy, free from mucus, pus and blood.

Diagnosis: Achylia gastrica and constipation. This patient was put upon a diet in which Graham bread and vegetables formed a prominent part, and in accordance with the deficiency of hydrochloric acid in the gastric secretion, which rendered the stomach practically useless so far as digestion is concerned, his food was so prepared that it could be passed freely into the intestine notwithstanding the lack of peptic digestion. Vege-

tables were given him so far as possible in *puree* form, and beef only finely ground. Of other meats he was given fresh fish and the white meat of fowl, both of which have short fiber and little connective tissue. To avoid the discomfort following a large meal, he was given three small meals at the usual hours with a simple luncheon at 9 a. m. and 3 p. m. No medication. For the first week, stools daily, but somewhat constipated. After the second week stools normal, no discomfort in stomach after meals. Patient after one year reports entire freedom from constipation and gastric disturbance. He has adhered to Graham bread and ground beef. His diet otherwise now differs little from that of most farmers.

CASE 5. Mrs. B., 61 years, teacher. Since girlhood has had occasional periods of epigastric pain, coming on gradually about one hour after eating and lasting almost until the next meal. The taking of food relieves the pain. Frequent headache, occasional nausea, no vomiting, no "heartburn." Appetite poor. The trouble comes in attacks lasting a few weeks, separated by longer periods of relief. Bowels habitually constipated, for many years no spontaneous evacuation. Patient in the habit of using a daily enema of plain water.

Patient was first seen in the beginning of an attack. Tongue coated, breath foul, chest normal, no abdominal tenderness, half of right kidney palpable on deep inspiration.

Urine free from albumin, sugar and casts.

Stomach empty in the morning. Test breakfast of toast and tea removed in one hour, well digested, amount obtained, 25 cc. Free hydrochloric acid, 1.8%, total acid, 2.8%. No mucus. Lower border of stomach one inch below umbilicus.

Stool free from mucus and blood.

The gastric symptoms in the case point clearly to hyperacidity of the stomach, and they are borne out by the analysis of the stomach contents. The patient was put upon a diet of six small meals a day, the last consisting of a glass of cream and a few



crackers at bed-time. To overcome the constipation there was a liberal allowance of proper vegetables and fruit, care being taken to exclude acid fruits, such as were known to cause distress. In accordance with the well-known property of nitrogenous foods, meat, eggs and milk (cream) of combining with large quantities of hydrochloric acid and thus relieving the pain of hyperacidity, these articles were allowed freely. Special instructions were given that all meats were to be thoroughly cooked, beef to be boiled (Pot-roast.)

After a few days of slight irregularity, the bowel movements became spontaneous daily, and have continued so (seven months).

As a means of temporary relief from the pain, the patient was ordered three times daily, after meals, a powder of *magnesia usta* and *Ext. Belladonn.*, of the latter gr.  $\frac{1}{4}$ . By mistake the powder was taken *six times a day*. It is needless to say that the mouth and throat became excessively dry — but the pain vanished on the second day and has not returned.

Patients often ask how long they will be obliged to adhere to their special diet. This question can never be answered. Some must continue it indefinitely; others, as the fourth patient, after a few months may relax somewhat, until their diet differs but little from what that of any normal individual should be. In fact, many sufferers from constipation, as, for instance, the young school-girl, eat habitually more meat and nutritious vegetables than is proper for any one. They soon become accustomed to their new régime and find it rather agreeable than otherwise. They learn, moreover, just what proportion of laxative articles is necessary to keep them in a healthy condition, and so avoid further trouble.

## CLINICAL REPORTS.

## AN UNUSUAL CASE OF MULTIPLE NEURITIS.

BY ELSWORTH SMITH, JR., M.D.

W. F. B., male, 37 years, American, insurance adjuster, entered my service at the St. Louis Mullanphy Hospital, July 9th, 1904, giving the following history: Father died of some stomach trouble, otherwise no suspicion of hereditary disease; had typhoid fifteen years, and gonorrhoea twelve years ago, with at time of gonorrhoea a genital venereal sore but no secondary symptoms and no antisypilitic treatment; indefinite rheumatic history five years ago. Three years ago he was in South America for ten weeks and in Cuba two months, during which time he had a slight attack of dysentery. The last year he had noticed some slight dyspnoea on exertion. Habits: For eight or nine years it had been his custom to drink from one pint to one quart of liquor in twenty-four hours; would have a bottle of liquor at the bedside so that he might imbibe during the night. He stopped short during May last on account of interference with his work and has not touched a drop since.

Present trouble: About five weeks prior to his entrance at hospital, and about one month after exposure to a hard rainstorm, he became ill of a "fever," had pains in the back and legs, and the pain extended also to the muscles of the neck; had also delirium, especially at night. The condition at that time was apparently considered rheumatic, although the joints were never in any way involved. For about ten days prior to his entrance had been suffering also with difficulty in swallowing solid foods, and also had regurgitation of liquids into the nose and larynx if not swallowed very slowly.

At time of entering the hospital he was suffering great pain in both upper and lower extremities with marked pain along the respective nerve trunks. He was quite helpless, being unable to move himself in bed, and could move his extremities only with difficulty. The head was flexed slightly and rotated to the right, in which position it was more or less rigidly maintained. There was paresis of the flexors of the thigh and quadriceps extensors, and extensors of the toes. In the upper extremity there was paresis of the biceps and of extensors of wrists and fingers, so that there was present both wrist and foot drop. Deep reflexes absent, but no ankle clonus or Babinski reflex. Station good and when placed on feet could take a few steps with difficulty. Pupils normal, no disturbance of vesical or rectal sphincters. Oedema of upper half of the body, especially marked in the right upper extremity, although the oedema originated in the left upper extremity and spread thence to the right side. Some slight oedema of the lower extremities, especially of thighs, very slight oedema of the legs and none at all of the feet. Deglutition was difficult with regurgitation into nose and larynx. Voice was nasal but no distinct ataxia in speaking. The record of the urine was as follows: —

July 11, 1904. Amber, cloudy, specific gravity 1025, acid, trace of albumin, no sugar, a few hyalin casts and pus corpuscles, the latter probably from a urethral catarrh.

July 17th. Amber, slightly cloudy, specific gravity 1020, traces of albumin, no sugar, few hyalin casts and many leucocytes.

July 29th. Pale yellow, cloudy, specific gravity 1027, trace of albumin, heavy sediment of phosphates, no casts.

The twenty-four-hour amount of urine ran as follows: July 11th, 42 oz.; July 12th, 22 oz.; 13th, 28 oz.; 14th, 24 oz.; 15th, 28 oz.; 16th, 30 oz.; 17th, 30 oz.; 18th, 36 oz.; 19th, 32 oz.; 20th, 29 oz.; 21st, 30 oz.

The course of the disease from date of entrance to this date had

been afebrile and the pulse had ranged between 80 and 90. The progress of the malady can perhaps be best followed through the bedside notes, which were as follows: —

July 20th. Oedema has almost entirely subsided in hands, some slight oedema of the forearm near the elbow. Slight atrophy of hand muscles. Gradual increase in the urine output.

July 25th. Hands slightly oedematous early this morning but are not so now. Swallowing, if anything, a little more difficult. Muscles of legs, tarsus and toes appear now only slightly involved. So, also, the extensors of the thigh, but there is quite marked paresis of the flexors and rotators of the thigh. Trunk muscles are also involved, as the patient cannot raise himself from a lying to a sitting posture but can to-day raise his legs into bed after lying down and can walk fairly well when once placed upon his feet.

July 29th. Some oedema of dorsal surface of right hand this morning.

August 2d. More puffiness of face and less of right hand.

August 4th. Has developed marked increase of oedema of arms and right leg.

August 6th. Oedema of right foot is added to other swollen parts this morning.

August 13th. Oedema of face and right lower extremity has been subsiding for past two or three days.

Aug. 16th. Some improvement in deglutition since use of galvanic current. Oedema of face now quite slight.

Aug. 26th. Deglutition is better, so also is oedema.

Sept. 6th. There is now only slight difficulty in swallowing. Galvanic current seems to have accomplished a great deal for this symptom. The palatal muscles involved in speaking show also great improvement. Oedema has practically disappeared.

Sept. 24th. Some pain about knees and upper calf muscles, but is otherwise steadily improving.

Sept. 26th. Electrical reaction as observed to-day by my

assistant, Dr. Fahlen, is as follows: Faradic current, — no response from shoulder and hip muscles on down to fingers and toes. Galvanic current, — normal response absent in above mentioned group of muscles but the slow, worm-like contraction not present. Sensation: Tactile sense entirely normal and acute, pain sense possibly slightly increased. Thermic sense normal.

Sept. 29th. Patient, though not now able to raise himself in bed without assistance, can yet get into bed by himself, can also move his head naturally and can walk about the ward. He can feed himself and swallow without difficulty. Condition of the muscular system, — the right upper extremity shows still slight paresis of deltoid and of extensors of forearm, carpus and fingers and some contractures causing limitation of extension of forearm. In the left upper extremity there is paresis of similar groups as on right side but to much less extent except as to extensors of fingers, which is very marked. Slight tenderness along main nerve trunks in right arm, none at all along those of the left. In the right lower extremity, paresis of adductors and flexors of thigh with contractures so that limb cannot be fully extended at knee. Paresis of flexors of leg and slight paresis of extensors of toes. Quite marked tenderness along posterior tibial nerve. Some slight tenderness along sciatic. In left lower extremity, slight paresis of adductors and flexors of thigh, slight paresis of flexors of leg and extensors of toes. Slight tenderness along sciatic. Flexors of right leg somewhat flabby, of left slightly so. Right calf muscles quite flabby.

The treatment consisted in administration of saturated solution of the iodide of potassium in increasing doses up to 26 drops three times daily. Infusion of digitalis in 2 dr. doses with strychnia were given more or less constantly, together with electrical treatment.

The points of interest in the case appear to be first, as to diagnosis, whether we have to do with a peripheral or a central

lesion. It would appear that the acute onset, absence of pupillary involvement, absence of involvement of sphincters or knee jerk and Babinski's reflex, would speak against a central lesion; while the pain and local tenderness along the course of the large nerve trunks, the progress of the case, and especially the tendency towards recovery, together with absent cutaneous anesthesia, the etiology and age of patient, speak quite strongly for the localization of the trouble in the peripheral nerves. But if a multiple neuritis, is it to be classified as a primary variety, or alcoholic or endemic? Beri beri can undoubtedly be excluded because the only possible source of such a malady, namely, the patient's trip to South America three years ago, would appear entirely too remote. While the history of over-indulgence in spirits is so marked as to compel us to classify the case as of the alcoholic type, still the onset of the trouble, if the patient's statement is to be relied upon (and he appears to have watched his case carefully), was far more acute than is usual in the alcoholic variety of this affection. High and prolonged fever, according to Dana, Osler and other observers, is a rare accompaniment of alcoholic neuritis, and while delirium was present there was no indication of that peculiar mental condition with marked loss of memory for recent events so characteristic of alcoholic neuritis. Then, too, it is rare to have a peripheral bulbar paralysis, though Strumpell mentions such cases. Another point of interest was not only the presence of oedema but especially its character. For the serous infiltration of the tissues was certainly not due to failure of cardiac compensation, as there was no cardiac lesion, and the oedema was not of dependent parts, as in heart disease, but rather of the upper part of the body; nor was there any intra-thoracic pressure or anemia to account for this symptom, and in the moist form of beri beri it is, I believe, conceded that the dropsy is of cardiac origin. So the explanation of this oedema must be found either in the kidneys or the vasomotor system of nerves. While the urine was not normal, still the

analyses were not such as we would expect to see in renal dropsy, for in acute or chronic parenchymatous nephritis, we would find albumin in large quantity, and even in chronic interstitial nephritis there would probably be albumin in considerable quantity when there had been a sufficient drop in blood pressure to change a polyuria into an oliguria and lead to dropsy; the dropsy, too, in contracted kidney is really cardiac in origin and therefore, appears first in dependent parts, etc. Therefore it would seem by exclusion that the dropsy in this case was most probably of an angioneurotic type, a view supported by its distribution mainly to the upper half of the body, and especially to the upper right extremity, and also by its tendency to change in site and degree from day to day.

At outset of case from the possibility of the dropsy being of cardiac origin, digitalis was administered, and as it seemed to exert a favorable influence on the oedema it was continued. At one time its administration was stopped with an apparent increase in the oedema, but with a corresponding reduction of the same on the drug being resumed.

From our present point of view of the case, however, this beneficial effect of digitalis must have been exerted through the vaso-motor system of nerves. For according to Quincke, the serous exudate of angioneurotic oedema is most probably due to a relaxation of the coats of the capillaries whereby the permeability of their walls is greatly increased. Digitalis, therefore, through its well-known vaso-constricting influence on the vascular circuit might easily control such a transudation.

## NEWS AND PERSONAL MENTION.

At the present writing, our Freshman Class shows an enrollment of 58 men. It is very gratifying that 44 of this number, 76%, are holders of diplomas of four-year high schools or of college degrees. Fourteen men came in on examination.

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The Journal of the American Medical Association, which is supposed to stand for the interests of the medical profession and the furtherance of medical education, published in its educational number, August 13, 1904, a "Table of State Board Examination Results in 1903." The table is incomplete, as indicated by asterisks, as to the returns from Illinois, Kansas, Montana and Pennsylvania. And yet, the statistical genius that got up this table, proceeds to calculate "Percentages of Failures" from these faulty data. Our medical department is made a victim of this inaccuracy. We are quoted as having had thirteen men up for examination, viz.: Four in California, one in Indiana, one in Iowa, one in Michigan, one in New York, one in North Carolina, three in Oklahoma, one in Washington. Three failures are recorded, viz., two in California and one in Oklahoma. And so we are charged with three failures out of thirteen applicants, or a failure of 23 per cent.

We have before us the official record of Dr. James P. Eagan, secretary of the Illinois State Board of Health, to wit: "In 1903 twenty-seven of your graduates appeared before this Board for examination, and all of these candidates passed successfully."



It appears, therefore, that of forty applicants three failed in 1903, or  $7\frac{1}{2}$  per cent.

And this figure is not a true indicator either. The two men that failed in California and the one that failed in Oklahoma, are graduates of long ago, before the organization of the Medical Department of Washington University, which took place in 1891. These men have evidently not kept pace with the modern advances in medicine.

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The Washington University Hospital is nearing completion and will accommodate 120 patients who are to be used for bedside instruction of the students. In connection with the Hospital a Training School for Nurses is to be established. Young women who contemplate engaging in such work are requested to write for particulars to the Dean, 1806 Locust Street, St. Louis. Attention is called to the following rules for admission and other particulars.

WASHINGTON UNIVERSITY HOSPITAL TRAINING SCHOOL FOR NURSES.—The Washington University Hospital offers a three years course of training to women desirous of becoming professional nurses.

1. Applicants should be between 20 and 30 years of age—possess a common-school education. They must produce certificates of good character and a physician's certificate of good health.

2. After approval they will be received into the school for two months on probation. During this time they will be lodged and boarded, receiving no other compensation. During the two months of trial and previous to being accepted as a pupil in the school, the applicant must be prepared for an examination in reading, penmanship, simple arithmetic, and English dictation. The examination is to test the applicant's ability to read aloud

well, to write legibly and accurately, to understand mathematics as far as fractions and per cent, and to take notes accurately. This amount of education is indispensable. Applicants are reminded that women of superior education and cultivation will be preferred.

3. If this examination has been satisfactory and if they are found morally and physically fit for the work, they must sign a contract, for three years, to obey rules and regulations of the school, dress in the uniform of the hospital, perform the duties assigned to them by the superintendent or head nurse, either in the hospital or when sent out to private cases, rich or poor, without extra compensation.

4. A monthly allowance of five dollars (\$5.00), will be made to each pupil. This sum is allowed for clothing, text-books, and other personal expenses of the nurses, but is in nowise intended as wages, it being considered that the education given is a full equivalent for their services. Board and washing will be furnished without charge, and in illness all pupils will have gratuitous medical attention, but time lost must be made up.

5. Applicants must bring with them: 1 pin ball, 1 pair scissors, 2 plain dresses of wash goods, 6 plain white aprons, made to come within two inches of the bottom of the skirt; 1 pair light shoes.

6. Day-duty shall be from 7 a. m. to 7 p. m., and night-duty from 7 p. m. to 7 a. m. Pupils are allowed one hour for outdoor exercise if possible; they are also given one-half day each week and one-half day on Sunday. One week of vacation is allowed each year.

7. INSTRUCTION. — Lectures will be given by the Medical Staff and the head nurse or the superintendent.

The instruction includes: —

1. The dressing of blisters, burns, sores and wounds, preparation and application of fomentations, poultices, cups and leeches, and of minor dressings.

2. The administration of enemas, and the use of the catheter, and the management of appliances for uterine troubles.

3. The management of helpless patients, making beds, changing clothing, giving baths in bed, prevention and treatment of bed sores, and the best methods of friction of the body and extremities.

4. Bandaging, making bandages and splints.

5. Care of patients' rooms, changing sheets while the patient is in bed, the best method of supplying fresh air, and of warming rooms and hospital wards.

6. Certain emergencies and how to treat them.

7. The preparation and serving of food for the sick.

The pupils will also be instructed to make accurate observations and reports to the physician in charge of the state of secretions, expectorations, pulse, skin, appetite, temperature of the body, intelligence (as delirium or stupor), breathing, sleep, condition of wounds, eruptions, formation of pus, effect of diet, of stimulants, and of medicine, and to learn the management of convalescents.

8. After a full term of three years the nurses must pass a final examination and will then receive a diploma, signed by the Dean and Secretary of the Medical Department and the Superintendent of Nurses.

The following program for the Training School has been adopted : —

1st Year: Anatomy, Physiology, Nursing, Bandaging, Asepsis, etc., Bedside Observation, Materia Medica, Practical Instruction.

2nd Year: Internal Medicine, Surgery, Obstetrics, Pediatrics, Dietetics.

3rd Year: Ophthalmology, Skin and Syphilis, Nervous Diseases, Gynecology, Nose and Throat Diseases, Ear Diseases, Orthopedics, Ethics in Nursing, Massage, Surgery.

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The Washington University Hospital is to have a complete Roetgen-ray equipment.

The formal opening of the new hospital will be duly announced to our alumni and friends.

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Dr. Robert James Terry, our Professor of Anatomy, was chosen Secretary of the Section in Human Anatomy of the International Congress of Arts and Science, that held its sessions at the Louisiana Purchase Exposition in St. Louis in September.

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A luncheon was tendered the delegates of the biologic and medical sections of the International Congress of Arts and Science by the Faculty and staff of teachers of the Medical Department of Washington University, Sept. 21, 1904. Dr. R. Luedeking, the Dean, presided. Among an attendance of 100 the following eminent men participated: Theobald Smith, Harvard University; Oskar Hertwig, Berlin; Yves Delage, member of the Institute of France; Wilhelm Waldeyer, Berlin; S. J. Meltzer, New York; Max Verworn of Göttingen; Pierre Janet, College de France, Paris; Morton Prince of Boston; William Osler of Johns Hopkins; William T. Councilman of Harvard; William T. Sedgwick, Massachusetts Institute of Technology; Ronald Ross, Liverpool; Ludvig Hektoen, Chicago University; Johannes Orth, Berlin; Sir Lauder Brunton, London; Frederick C. Shattuck, Harvard; T. Clifford Allbutt, Cambridge; William S. Thayer, Johns Hopkins; L. F. Barker, Chicago; Shibasaburo Kitasato, University of Tokio; James J. Putnam, Harvard; Charles L. Dana, Cornell University; Edward Jackson, Denver; George M. Gould, Philadelphia; Sir Felix Semon, London; Theodore Escherich, Vienna; Abraham Jacobi, New York; John H. Musser, Philadelphia; William B. Northrup, New York; R. A. Reeves, Toronto; William H. Welch, Johns Hopkins.

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The opening exercises of the school were held on Monday, September 26, 1904. An address was made by Dr. Robert

Luedeking, the Dean, and, in the absence of the author, an interesting paper by Dr. William S. Thayer, of Johns Hopkins, was read.

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The Annual Announcement of the Co-operative Association has just appeared and is ready for distribution among instructors, students and alumni of the Medical Department. An examination of this publication is worth the while of all who are interested in our progress. The Association is beginning its fourth year and it will not be out of place to call attention to what it is doing for the school.

The one object of the Association is to provide funds for the support of the Medical Department library. It does this by conducting in the school building a store where books and supplies are sold to students at reasonable prices. The annual income from the store is placed at the disposal of a committee of the faculty and expended upon the library.

Three years ago the school had no books which could be used except those belonging to the departments of anatomy, physiology, pathology and chemistry. As these books consist almost exclusively of files of foreign scientific journals, they are of no practical use to students. In addition to these journals, it is true that the school had three thousand or more antiquated text-books. But these were also of no use, because they had not even been catalogued. In brief, such was the condition of affairs when the first attempt was made to create a library that should some day be a credit to the school.

The library derives an annual income of from five to seven hundred dollars from the earnings of the Association. All the books owned by the school have been catalogued and made accessible to those who care to use them. A room, where students may read and study, has been equipped with tables, chairs and book-cases. It is well lighted and under the supervision of a student-librarian, whose duty it is to maintain order and issue books.

It is the intention of the committee in charge of the library to expend the money placed at its disposal so that it shall benefit students and teachers alike. Students use books of reference more than they do journals which appeal rather to those engaged in more advanced work. The library has not been neglected in this respect. In the past two years between four and five hundred dollars have been expended upon reference-books, dictionaries and encyclopaedias. New books upon nearly every subject taught in the third and fourth years have just been placed upon the shelves. These represent an expenditure of about one hundred dollars.

While the committee recognizes the value of reference-books, it realizes at the same time that medical text-books soon grow old and are replaced by those of more recent date. The essential foundation of a good library is its files of scientific journals, for the writers of text-books draw from these sources most of their material. It will not be necessary to enumerate the list of such journals owned and subscribed for by the school, as the Announcement of the Association has published it and it appears elsewhere in this Bulletin. These journals are apportioned to the several departments as follows: —

Anatomy . . . .	8	Chemistry . . . .	4
Physiology . . . .	8	Pharmacology . . . .	1
Pathology and		Pharmacy . . . .	1
Bacteriology . . . .	7		

Last year the library subscribed for several new journals and also purchased a few complete sets. The department of anatomy was given complete sets of two journals, namely: —

Internationale Monatschrift für Anatomie und Physiologie.  
Gegenbaur's Morphologisches Jahrbuch.

The current numbers of these journals are being taken. The volumes needed to complete a set of "Anatomischer Anzeiger" were purchased and the subscription was continued. The volumes

needed to complete a set of Hoppe-Seyler's "Zeitschrift für Physiologische Chemie" were purchased for the chemical department. During the coming year a set of Maly's "Jahresbericht über die Fortschritte der Thierchemie" will be completed. Last year a set of "Berichte der Deutschen Chemischen Gesellschaft," beginning with 1883 and complete to date, was presented to the chemical department. This was the gift of Professor Charles R. Sanger of Harvard University, formerly professor of chemistry in this school. A set of "Chemisches Central-Blatt," beginning with 1897 and complete to date, was also added to the chemical department. The school has also taken from the beginning "Biochemisches Centralblatt." The possession of all these invaluable scientific journals is due entirely to the Association.

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Several medical and scientific journals have recently been donated to the library. In one instance the subscription dates from 1903, in another from 1904, but most of them will begin in 1905. They are the following: —

1. Archiv für Anatomie und Physiologie. P. Y. Tupper, M.D.
2. Zentralblatt für Normale und Pathologische Anatomie mit Einschluss der Microtechnik. Willard Bartlett, M.D.
3. Ergebnisse der Anatomie und Entwicklungsgeschichte. R. J. Terry, M.D.
4. Zeitschrift für Biologie. S. P. Budgett, M.D.
5. Zeitschrift für Physikalische Chemie. W. H. Warren, Ph.D.
6. Münchener Medizinische Wochenschrift. W. H. Rush, M.D.
7. Berliner Klinische Wochenschrift. Jesse Myer, M.D.
8. Wiener Klinische Wochenschrift. Jesse Myer, M.D.

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During the past ten years almost no attention has been paid to binding scientific journals. In consequence of this neglect many

unbound volumes have accumulated in the libraries of the departments of physiology, pathology, anatomy and chemistry. Between one and two hundred dollars will be expended this year in binding all these journals. In the future a portion of the annual income will be set aside for this purpose and the volumes will be bound as soon as they are completed. This will improve the library and facilitate looking up references.

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A student can take out a book for home or reading-room use by writing his name and the title of the book upon a slip and presenting it to the librarian. When he returns the book, the slip is canceled and filed. These slips have not been kept long enough to show just how the library is being used but they give some indication. Students of the first and second-year classes take out about seventy-five per cent of the books issued. When a teacher calls attention to books bearing upon his subject, such books are in great demand. Of course seriously inclined students who are making all they can of the four years do not have to be told to read. They have incentive enough to find out what is necessary and they are not content with the mere "say so" of the teacher. This is probably the reason why the names which appear most frequently upon library slips are those of students whose standing in the school is highest, whereas the names of those doing the poorest work are conspicuous by their absence.

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In concluding this report upon the present status of the library, considerable emphasis should be placed upon the duty of each teacher to the library. It is not enough to donate books, however valuable they may be. The library needs the personal interest of every teacher in the school. A personal inspection of the library would be a demonstration of such interest. Does the library contain the books which you regard as necessary for the instruction of your students? If it is deficient in any respect, it



is clearly your duty to know it and to inform the library committee of your needs. And when the proper books have been placed upon the shelves for circulation, it is further your duty to see that your students are made to use them.

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The medical library of the university has received many valuable contributions during the past months, among these are to be mentioned ; — the entire library of the late Dr. J. B. Johnson. This collection numbers upwards of two hundred and fifty volumes. We find among them, Vols. i — ii and iii of Galen's works, in the original Latin, bound substantially in parchment. The Medical and Surgical History of the War of the Rebellion prepared by act of Congress in 1879, is also in the collection, comprising four very large volumes.

Other contributions received are as follows : —

A score or more of books from Dr. Chas. Dixon. Machse's Surgical Anatomy is among them. The surgical plates in this work deserve special mention.

Dr. Gustav Baumgarten has added several valuable books.

Dr. S. P. Budgett has made repeated contributions of new books.

Dr. H. M. Whelpley sent to the library a large number of pamphlets and journals, and has sent books from time to time.

Dr. H. A. Geitz, has made a contribution of books.

Dr. H. N. Spencer presented Vols. I to VI complete of American Medicine.

A complete file of thirty-one of the leading medical journals are now in the library room. New publications are soon to be added.

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The coöperative association of the school has increased its stock by five thousand dollars worth of new books. Students

and alumni can conveniently obtain books, journals, subscriptions and laboratory supplies, frequently at much reduced rates, from the Association. Such purchases will be shipped prepaid to any part of the United States.

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The new pathological laboratory at St. Luke's Hospital has been furnished by the Association.

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At the section on gynecology of the International Congress of Arts and Science held in St. Louis, September 19-25 of this year, the discussion following the paper of Dr. J. A. Sampson, of Johns Hopkins Hospital, developed a marked unanimity of opinion among the participants that steps should be taken to further the wider diffusion of knowledge on this subject. The appalling mortality from uterine carcinoma can be reduced only when earlier diagnosis leads to earlier operation, and to this end it is equally necessary that the laity learn to recognize the significance of the earliest signs of uterine cancer, and that physicians in general have placed at their disposal all the facilities needed for an early microscopic diagnosis. The chairman of the section, Dr. Howard Kelly, of Baltimore, appointed a committee to present a plan to this effect at the meeting of the American Medical Association in Portland, Oregon, next June. The committee is made up as follows: Dr. J. A. Sampson, of Johns Hopkins Hospital; Dr. F. J. Taussig, of our Medical Department, and Dr. J. B. Clark, of Philadelphia.

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At the recent annual meeting of the Alumni Association of the Washington University Medical Department it was decided no longer to hold monthly meetings, as in the past, but to have besides the annual banquet and the annual election of officers only two scientific meetings, one in each semester. It is hoped that

each of these last will be a notable gathering for mutual profit and fellowship of the alumni and the teaching body of the school. The following officers were chosen to serve for the current scholastic year: Dr. A. F. Koetter, president; Dr. J. B. Falk, vice-president; Dr. F. J. Taussig, recording secretary; Dr. O. H. Campbell, corresponding secretary; Dr. Phil. Hoffman, treasurer.

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The following scientific journals are kept in the rooms of the professors in charge of the several departments and may be obtained by applying for them.

*Annales de l'Institut Pasteur.* 8-18. Paris 1894-1904.

*Anzeiger, Anatomischer.* Hrsg. v. K. v. Bardeleben. Band 1-25, mit sämtlichen Ergänz-Heften. Jena 1886-1904.

*Archiv für mikroskopische Anatomie u. Entwicklungsgeschichte.* Hrsg. von M. Schultze, La Valette St. George, O. Hertwig u. W. Waldeyer. Band 35-64, mit Supplementen u. Gen.-Reg. Bonn 1890-1904.

*Archiv für experimentelle Pathologie u. Pharmakologie.* Redig. von E. Klebs, B. Naunyn u. O. Schmiedeberg. Band 27-36. Lpzg. 1890-1895.

*Archives Italiennes de Biologie.* Revues, résumés, reproductions des travaux scientifiques italiens, dir. A. Mosso. Vol. 8-20. 1890-1894.

*Archiv für patholog. Anatomie u. Physiologie u. für klin. Medicin.* Hrsg. v. R. Virchow u. J. Orth. Band 119-177, mit sämtl. Supplementen u. Gen.-Reg. zu Bd. 1-150. Berl. 1890-1904.

*Archiv für Physiologie.* Hrsg. v. E. du Bois-Reymond u. W. Engelmann. Jahrg. 1877-1903. Supplementheften.

*Archives de physiologie normale et pathologique.* Publ. par Brown-Séquard, Dastre, Charcot, etc. Mit den dazu gehörigen Gen.-Reg. Paris 1890-1894.

Archiv für die gesammte Physiologie. Hrsg. von E. F. W. Pflüger. Band 1-94 mit Supplement u. Reg. Bonn 1868-1904.

Beiträge zur pathologischen Anatomie und zur allgemeinen Pathologie. Hrsg. von E. Ziegler. Band 15-25. Jena 1894-1904.

Berichte der Deutschen Chemischen Gesellschaft. Vol. 16 to date: 1883-1904. Eigenthum der Deutschen Chemischen Gesellschaft.

Biochemisches Centralblatt. Hrsg. von C. Oppenheimer. Bd. 1-3. Berlin 1902-1904.

Chemisches Central-Blatt. Hrsg. von A. Hesse. 1897-1904 Berlin.

Centralblatt für Bakteriologie, Parasitenkunde u. Infektionskrankheiten. 1. Abteilung: Medizin.-hygien. Bakteriologie u. tier. Parasitenkunde. Hrsg. von O. Uhlworm. Bd. 1-34. Jena 1887-1904.

Centralblatt für allgemeine Pathologie u. patholog. Anatomie. Hrsg. von E. Ziegler u. Cl. v. Kahliden. Band 1-14. Jena 1890-1904.

Centralblatt für Physiologie. Hrsg. von. Exner, Gad, Fuchs u. Munk. Band 1-17. (Litteratur für 1887-1903.) Wien 1888-1904.

Ergebnisse der Anatomie u. Entwicklungsgeschichte. Hrsg. von Merkel u. Bonnet. Band 1-11. Weisb. 1892-1903.

Internationale Monatsschrift für Anatomie und Physiologie. Hrsg. unter Mitwirkung Anderer von A. E. Schäfer, L. Testut, W. Krause. Band 1-20. Berlin 1884 — Leipzig 1903. Mit zahlr. Tafeln.

Jahresberichte über die Fortschritte der Anatomie u. Entwicklungsgeschichte. Hrsg. von G. Schwalbe. Neue Folge. Band 1-8. (Litteratur für 1892-1902.) Jena 1897-1903.

Jahresberichte über die Fortschritte der Anatomie u. Physiologie. Hrsg. von Hofmann, Hermann, Schwalbe. Lpzg. 1878-03.

Jahresberichte über die Fortschritte in d. Lehre v. d. pathogenen Mikro-organismen. Hrsg. v. P. v. Baumgarten u. F. Tangl. 1885–1904.

Jahresbericht über die Fortschritte der Thier-Chemie. Hrsg. von R. Maly u. A. Band 19–24 (für d. J. 1889–1894). Wein u. Weisb.

Jahrbuch, Morphologisches. Hrsg. v. C. Gegenbaur. Band 1–32 u. Supplement zu Bd. 4. Lpzg. 1876–1904.

Journal, American, of Anatomy. Ed. by L. F. Barker, T. Dwight, S. H. Gage, G. Carl Huber, G. S. Huntington, Franklin P. Moll, Charles S. Minot and George A. Piersol. Vols. 1 to 4. Baltimore 1901–1904.

Journal, American, of Physiology. Ed. by American Physiological Society. Vol. 1–11. Boston 1898–1904.

Journal of Physiology. Ed. by M. Foster and J. N. Langley. Vols. 1–29. With many plates. Cambridge 1879–1904.

Proceedings of the Association of American Anatomists. History, Constitution, Membership and the Titles, Abstracts and Papers from 1888 to 1901. Sessions 1–14.

Schmidt's Jahrbücher der in- und ausländischen gesammten Medicin. Jahrg. 1890. Lpzg.

Skandinavisches Archiv f. Physiologie. Hrsg. v. Tigerstedt. Bd. 1–7. 1888–1895.

Zeitschrift für Biologie. Hrsg. von Buhl, M. v. Pettenkofer, Radlkofer u. Voit. Band 1–30 Münch. 1865–94.

Zeitschrift für Hygiene u. Infektionskrankheiten. Hrsg. von R. Koch u. C. Flügge. Band 11–46 u. Gen.-Reg. Lpzg. 1892–1904.

Zeitschrift für physiologische Chemie. Hrsg. von Hoppe-Seyler u. A. Kossel. Band 1–40 mit Sach. u. Autorenreg. zu Bd. 1–30. Strassb. 1877–1904.

Zeitschrift für Psychologie und Physiologie der Sinnesorgane Hrsg. von H. Ebbinghaus u. A. König. Band 1–6 mit den Ergänzt.-Bänden u. Gen.-Reg. zu Bd. 1–6. Hamb. u. Lpzg. 1890–1893.

*Zeitschrift für wissenschaftliche Mikroskopie.* Hrsg. von W. J. Behrens. Band 1-21 u. Reg. Brnschw. u. Lpzg. 1884-1904.

*Zentralblatt für Normale u. Pathologische Anatomie mit Einschluss der Mikrotechnik.* Hrsgb. R. Krause u. M. Mosse Bd. 1. Berlin, Wien. 1904.

We regret that the subscription for several journals in this list was allowed to lapse, making it very difficult to obtain the intermediate volumes when the subscription has been renewed. The Co-operative Association has completed several sets already, but this is a severe tax on the treasury, and cannot be carried further this year until the binding has been done for quite a large number of books. While this is the case, the Association will continue the subscription for several journals if the money can be found to make sets complete. Most needed are the following: *Archiv. f. experimentelle Pathologie u. Pharmacologie*, 1896 to date; *Archiv. Italienne de Biologie*, Vols. 1-7 and 20-39; *Archiv. f. Mikroskopische Anatomie u. Entwicklungsgeschichte*, Vols. 1-34; *Jahresbuch über die Fortschritte der Thier-Chemie*, Vols. 1-18 and 25-33; *Skandinavesches Archiv. f. Physiologie*, Vols. 8-14; *Zeitschrift f. Biologie*, Vols. 31-45; *Journal of Comparative Neurology*.

A valuable acquisition to the department of anatomy has just been made by the purchase of ten series of the Ziegler embryological models. These beautiful images as everyone knows are not copies made from dissections, but are reconstructions in hard wax of microscopical preparations from the German anatomical laboratories. Each model stands for some celebrated research of His, Hertwig, Hatschek, Häckel, Kiebel and others.

The collection comprises: —

1. Development of *Amphioxus* (Prof. Hatschek), 25 models.
2. The four principal forms of segmentation and development of the gastrula (Prof. Ernest Häckel), 22 models.
3. Human Embryos of the first month of pregnancy (Prof. His), 8 models.
4. Anatomy of the human embryo (Prof. His), 8 models.

5. Development of the human brain (Prof. His), 8 models.
6. Development of the eye (Prof. Manz), 9 models.
7. Development of the human heart (Prof. His), 12 models.
8. Development of the human urogenital apparatus (Prof. Kaibel), 8 models.
9. Development of the human internal ear (Dr. His, Jun.), 4 models.
10. Development of the human skull (Prof. O. Hertwig), 2 models.

These models are of great value in teaching and fill a long felt want for students and instructors alike. With this good beginning it is hoped the collection will grow a little every year by the addition of a new series.

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In a few more days the museum-laboratory-study room will open from 9 a. m. until 5 p. m. This will relieve the crowded condition of the reading room and halls, and it is believed will conduce not only to greater comfort, but to better work. The classes in histology and embryology occupy the room daily from 11-1 except Saturday when they come from 9-11. Students are reminded that the collection of anatomical literature is now on the top floor so that books and study room are conveniently near.

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During the past winter many new preparations were added to the anatomical museum. These include wax and rubber corrosions of organs, dissections and other wet preparations of the vascular system, Kaiserling specimens of normal organs, and some beautiful preparations of certain muscle groups and joints.

Dr. J. A. Brown's ear corrosions were shown at the meeting of the Association of American Anatomists in Philadelphia last winter and are now in the Medical Department exhibit at the Fair. The results obtained by the following students have been much admired: J. H. Clark, G. F. Middlebrooks, A. M. Sparling, J. C. Bowman, N. H. Kirby, E. J. Bribach, M. W. Jacobs, H. F. Lincoln, Jr., S. P. Martin, J. E. Cook.

## THE PROBLEMS OF INTERNAL MEDICINE.\*

BY WILLIAM SIDNEY THAYER, M.D.

To recognize, to prevent, to protect, to heal — these are, in the broadest sense, the tasks of internal medicine now as ever. But how different are the problems which occupy our attention to-day from those of the period commemorated by this congress. Let us for a moment glance back at the medicine of the close of the eighteenth and the beginning of the nineteenth centuries. For over two hundred years the blind and binding faith of the middle ages, the faith that had so long fettered the human mind, had been slowly giving way before the forces of reason and truth. Now and again with ever-increasing frequency, great and courageous minds had risen above the clouds of medical tradition and dogma, which had smothered the understanding and reason of mankind, as if, indeed, medicine were a part of the religious doctrine which ruled the world. For truly the medicine of the middle ages was largely a matter of faith, and as a matter of faith one in which reason beyond a certain point was heresy and sacrilege. Vesalius with genius and courage had begun to withdraw the veil from naked and iconoclastic truth. Harvey had made his great discovery. Glisson had demonstrated his theory of irritability. Mayow with his "*Spiritus nitro-æreus*" had anticipated the discovery of oxygen. Leeuwenhoek and Malpighi and Hooke had opened to the human eye the realm of the infinitely small. Bacon and Descartes and Newton and Locke had introduced into the world a rational and natural philosophy. Locke, him-

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\* Address delivered before the Section for Internal Medicine of the International Congress of Arts and Sciences, at St. Louis, September 22, 1904, and read by the dean of the Medical Department of Washington University, on Sept. 26, 1904, at the opening exercises of the school.



self, indeed, a wise physician, had pointed clearly to the true path of medical progress. "Were it my business," says he, "to understand physick, would not the safer way be to consult nature herself in the history of diseases and their cures, than espouse the principles of the dogmatists, methodists, or chymists."

But the clouds of medical tradition were slow to clear away. Gradually, however, the first "lonely mountain peaks of mind" had been followed by an ever-increasing number of earnest and untrammelled students. In the seventeenth century the opportunity to give one's life freely to the search for truth had become more and more open to all. The mysticism and animism of Stahl which, in the early part of the eighteenth, hung over the medical world, was already breaking away. The study of the natural sciences was pursued more eagerly and generally than ever before. Reaumur and Black and Haller and Spallanzani and Hunter and Priestley and Lavoisier had lived. Morgagni, sweeping aside the dogmatism of the old schools, had demonstrated the local changes in many diseases and had opened the way for the objective pathological anatomy of Bichat. In the field of practical medicine such men as Sydenham and Morton and Torti and Lancisi practiced and taught much which holds good to-day. Boerhaave had introduced clinical instruction. Cullen and Cheyne and Huxham and Pringle and Heberden and Van Swieten and De Haen were all in many ways true and faithful students; yet methods and doctrines that were often strangely fantastic still held general sway — such, for instance, as the Brunonian system. A perusal of the writings of Stoll, one of the wisest practitioners of his day, cannot fail to impress one with the meagerness of the basis of anatomy and physiology, normal and pathological, on which medicine rested, the almost entire lack of diagnostic methods, the absence of a rational therapy — how much of the conjectural, how little of the scientifically exact there was in medicine.

Diagnosis, based largely upon gross clinical conceptions, was necessarily vague and uncertain.

Prophylaxis, in the absence of any certain knowledge of the causes and manner of origin of disease, was devoid of any sound basis.

Treatment was almost wholly empirical, and, where it was not empirical, it was frequently based upon some theoretical system so arbitrary and dogmatic that the unfortunate sufferer was too often stimulated or purged, fed or bled, as he fell into the hands of a Brown or a Broussais rather than according to the nature of his malady.

In the Dictionnaire de l'Académie Française for 1789, a year which marks the end of an era in the world at large, one finds the following definition: "Médecine. s. f. L'art qui enseigne les moyens de conserver la santé & de guérir les maladies (La médecine est un Art conjectural \* \* \*)." Medicine, a conjectural art! Such was the estimate placed upon our profession by the French Academy a little over one hundred years ago.

But the seeds of a new life had been sown and the germination had already begun. Even as these words were written Lavoisier, too soon to fall a victim to the premature explosion of the forces of pent-up freedom, was in the midst of his great work. In 1796 came the introduction of vaccination by Jenner, and but a few years later Bichat, with his wonderful genius, took up the thread dropped by Morgagni and placed anatomy and physiology, normal and pathological, on a basis of accurate observation and experiment. Hand in hand with the introduction of exact methods of anatomical and physiological observation, Auenbrugger in 1761 had demonstrated in his "Inventum Novum" a method of physical investigation which, for the first time, enabled the physician to determine changes in size, shape and consistency of the thoracic organs. At first unnoticed by the world, this important discovery was destined to gain a sudden general recognition in the early days of the nineteenth century. With the spread of

knowledge of the gross pathological changes in disease which followed the inspiration of Bichat, the work of Auenbrugger, expounded by Corvisart, became a common possession of the medical world, and less than ten years later, Laënnec, by the introduction of mediate auscultation, opened possibilities for accurate physical diagnosis such as had not been dreamed of in the ages which had gone before.

With the great school of French observers which followed Laënnec, Andral, Chomel, Louis, Bouillaud and Trousseau, with Skoda and Schönlein in Germany and Addison and Bright and Stokes in England, the exact association of clinical pictures with local anatomical changes made great advances. Typhus and typhoid fevers were distinguished; the relation between albuminuria and renal disease was demonstrated; the association of endocarditis with acute rheumatism was discovered; the corner-stone of our knowledge of cerebral localization was laid. Clinical diagnosis was becoming more than a conjectural art.

In the meantime physiology was making great strides. Majendie, Bell, Johannes Müller, Beaumont and finally Claude Bernard and a host of their followers, were shedding light upon many obscure corners of our knowledge of the vital functions. In the hands of Müller the microscope began to open up new fields of study which were destined in a few years, through the cultivation of the genius of a Virchow and a Max Schultze, to bear a noble harvest. The "great reform in medicine" which followed the introduction of the cellular pathology laid solid foundations for much which is most vital in our anatomical and physiological and pathological knowledge of to-day, and the correlation of these observations with the results of accurately recorded clinical studies, the application of the microscope to the study of the urine, the sputa, the blood, to pathological neoplasms, to exudates and transudates, soon brought new material for the rising edifice of a rational, exact diagnosis. The sphyg-

mograph, the thermometer, the ophthalmoscope, the laryngoscope, the binaural stethoscope, the stomach tube, the various means for studying the blood pressure, all have brought their aid, while but yesterday the discovery of Roentgen gave us new and un hoped for diagnostic assistance.

At the same time, physiological chemistry which, with the work of Berzelius on the urine, had taken its place by the side of the more purely physical methods of investigation, has year by year given us greater diagnostic assistance in the analysis of the different secretions and excretions of the body and in the explanation of the various metabolic processes of the economy.

The development in the hands of Duchenne and Erb and Remak of electrical diagnosis, together with the great advances in physiology and pathology of the nervous system, have afforded explanation for much that was previously incomprehensible and have given us powers of diagnosis which, a few generations ago, would have seemed almost magical.

Finally Pasteur and Koch, with the introduction of bacteriological investigation, opened the way to the discovery of the causal agents of a large group of infectious diseases. These discoveries, followed rapidly by the evolution of methods allowing of the clinical demonstration of many pathogenic micro-organisms, offered an early, exact and positive diagnosis, on the one hand, in conditions where previously the disease was recognizable only at a stage in which it had made inroads into the system so great as to be often beyond relief, as in tuberculosis, and, on the other, in maladies the existence of which, without these methods, was to be definitely determined only after the onset of an epidemic, as in cholera, plague and influenza. When one thinks of what the last quarter of a century has taught us with regard to tuberculosis, anthrax, tetanus, diphtheria, typhoid fever, cholera, plague, dysentery, influenza, not to speak of the great group of wound infections, we may begin to realize what bacteriological

methods have done for diagnosis — how many diseases have been cleared up — how many symptoms have been explained.

In like manner Laveran with the discovery of the parasite of malarial fever, did much to bring certainty and precision into a field in which many had gone astray, while opening the way for the important observations of Theobald Smith and all the knowledge which we have gained in recent years with regard to the hæmatozoa of man and animals.

As a direct result of the introduction of bacteriological methods, the study of the manner of action of infectious agents and their toxic products upon the animal organism, as well as of the powers of resistance of the economy against infection, has given us, with the discovery of specific agglutinines and precipitines, diagnostic methods of the greatest value, not only for the recognition of various infectious processes, but for the identification of specific sera, affording in particular a test for human blood destined, probably, to prove, when properly applied and interpreted, of great medico-legal value.

This is, indeed, a gain over our knowledge of one hundred years ago. In how many fields has the conjectural given way to the exact! At the end of the eighteenth century the diagnostic effort of the physician, unaided by instruments of precision or even by the simplest physical methods of auscultation and percussion, was directed toward the detection of gross anatomical changes. To-day with our increased knowledge of anatomical, physiological and pathological processes, with our growing insight into the chemical and physical features of vital activity, our duty no longer ends in the recognition of physical changes in organs, in the determination of the presence of a specific lesion or infection; it is, further, our task to search for the earliest evidence of disturbance of function which may later lead to grosser, more evident change, to separate the physiological from the pathological, to estimate, as far as may be, the power of resistance of the different organs and tissues and fluids of the body to insults

of varying nature, to determine the functional capacity of a given organ — its sufficiency or insufficiency. In addition to increasing opportunities in the field of pathological anatomy we find ourselves drawn further into the study of pathological physiology — and knowledge in the field of pathological physiology leads of necessity to power in functional diagnosis.

It must be acknowledged that with regard to many organs the determination of the limits of functional power and the estimation of the degree of impairment in disease, are matters most difficult to appreciate, yet with improved methods and persistent research progress is being made.

We are, after all, but beginning to realize a few of the possibilities before us, but even this is a step in advance which holds out no little promise for the future and offers new and tempting opportunities for study and investigation.

At the end of the eighteenth century but three important, rationally conceived measures of prophylaxis had been practiced — the dietetic measures of protection from scurvy, the older inoculation and Jenner's great contribution of vaccination against small-pox. It was not, indeed, until the development of bacteriology that prophylaxis took its place as a scientifically exact branch of medicine. The recognition of the specific cause of many infectious diseases, the knowledge of the life history of the pathogenic micro-organisms, the discovery of the portals through which they gain entrance to the animal economy, and the conditions under which infection occurs, have brought to us material powers to prevent and protect. The first great result of this new knowledge was the development of antiseptic surgery and all that it represents. But apart from this we have but to remember what has been gained by a scientifically evolved prophylaxis against tuberculosis and typhoid fever — to reflect upon how far cholera and plague have lost their terrors — to contemplate the brilliant results of the discovery by Ross and the Italian school of the life history of the malarial parasites

as manifested in the anti-malarial campaigns carried on in various regions by Koch, and in Italy by the Society for the Study of Malaria, a noble institution of which our Latin brothers may well be proud, and lastly, to look upon the beneficent and far-reaching influence of the recent work of Reed and Lazear and Carroll and Agramonte with regard to yellow fever, to realize what bacteriological and parasitological studies are doing for preventive medicine.

But beyond this external prophylaxis, the studies of the problems of immunity beginning with Pasteur's inoculations against anthrax in 1881, have given us, so to speak, an internal prophylaxis, a functional prophylaxis if one will, in the possibility of producing a greater or less degree of individual immunity, such, for instance, as is now possible in diphtheria, cholera, plague, typhoid fever and dysentery.

The enforcement of scientifically planned and accurately deduced prophylactic measures has become to-day one of the main duties of the practitioner of medicine. It is as much the task of the physician nowadays to guard over the disposal of the sputa of his tuberculous patient, of the excreta of the sufferer from typhoid fever or cholera or dysentery, as it is to attend to the immediate wants of the invalid. How rapidly has the exact replaced the conjectural in this branch of medicine!

But while diagnosis and prophylaxis were being removed from the domain of conjecture to the field of exact observation and reason and research, while the possibilities of surgery were rapidly widening through the discovery of anæsthesia and the introduction of antiseptic methods, medical treatment, until the last two decades, still remained largely empirical. The development of exact clinical methods of observation and the statistical tabulation of experience for which we are especially indebted to Laënnec and Louis and their followers, gradually brought about, to be sure, many advances, while a large number of useful therapeutic agents introduced by the newly developed science of pharmacology, and

exactly tested by improved methods of physiological study added greatly to the armamentarium of the physician for the relief of symptoms. The power to combat disease specifically, however, remained much as it was at the beginning of the century. Mercury in syphilis, quinine in malarial fever, were the only specifics known to the medical world—and the action of these was unexplained.

The introduction by George Murray, less than fifteen years ago, of the treatment of myxœdema and allied conditions by extracts of the thyroid gland, was a direct application of the results of physiological observation to the treatment of disease. If this gave rise to hopes of the possibility of obtaining like results from roughly obtained extracts of other ductless glands, which have hardly been fulfilled, yet this discovery was the first step toward the rational scientific therapy to which we are beginning to look forward to-day.

But a moment ago I spoke of the importance of the influence of the discovery of the causal agents of the infectious diseases upon the development of exact diagnostic and prophylactic methods. Great and impressive as these have been, yet the studies which have followed as to the manner in which these agents act upon the human organism, and of the powers of resistance which the body exerts against them, the investigation of the problems of immunity, have opened out a far wider field. The early studies of Metschnikoff and Buchner and Nuttall were followed with rapidity by the epoch-making work of Behring and Kitasato and Roux with regard to tetanus and diphtheria. The diphtheria and tetanus antitoxines were not chance discoveries of empirically determined virtue, but true specific, therapeutic agents, the results of experiment scientifically planned and carefully prosecuted. Wide-spread investigations of the various phases of immunity, bacterial and cytotoxic, have given us in a few short years a mass of physiological knowledge, the full import of which is scarcely yet to be comprehended. Few things in modern



medicine are more impressive than a survey of the work of the last twelve years done under the inspiration of Ehrlich.

Beside the antitoxines of diphtheria and tetanus and the power of producing a greater or less degree of immunity, as has already been mentioned, by preventive inoculations against cholera, plague and typhoid fever, we have come to possess a bactericidal serum of a certain value in combating the actual disease, plague, while the favorable influence of Shiga's antidyenteric serum seems to be undoubted. There is much reason to hope that the recently promised anti-crotalus serum of Noguchi as well as the anti-cobra serum of Calmette may prove to be real boons to humanity. But it is not alone in the production of specific anti-sera, that the therapeutic value of the modern studies of immunity lies. There are signs which justify us in looking forward to the possible discovery of an explanation of the mode of action of substances long empirically used, knowledge the value of which may be readily appreciated.

When we consider these facts it is, indeed, easy to appreciate to what an extent the exact has driven the conjectural from this last field of medicine. A hundred years ago we were depleting and purging and sweating and bleeding according to theories often strangely lacking in foundation, the prevalence of which depended rather upon the individual force and vigor of the expounder than upon their intrinsic merit. To-day from the study of the pathological physiology of bacterial and cytotoxic intoxications, we are rapidly evolving scientific preventive and curative measures, while searching out the rationale and mode of action of our older therapeutic agents.

But a few days ago, I happened to open a copy of Littré\* bearing, by a curious chance, the date of 1889, and read "Médecine (mé-de-si-n') 1° Art qui a pour but la conservation de la santé et la guérison des maladies, et qui repose sur la science des

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\* Dictionnaire de la langue Française.

maladies ou pathologie" — an essential modification of the definition of one hundred years before and indicative of the changes of a century.

To meet the manifold problems of to-day the training of the physician must, of necessity, be very different from what it was a hundred years ago. The strong reaction which set in in the earlier part of the nineteenth century against philosophical generalization in medicine, the insistence upon a strict objectivity, all the more emphatic because of the prevalence of anatomical methods of research, have held very general sway. Medicine, no longer resting upon a basis of philosophical speculation, stands upon the firmer foundation of the exact natural sciences. Almost from the beginning the student of to-day is taught methods, where a hundred years ago he was taught theories. The enormous expansion of the field which must be covered has led, naturally, not only to an ever-increasing specialism, but to the fact that the course of study which is regarded as properly fitting the physician for practice is reaching backward farther and farther into the earlier years of his school training. On the other hand, in this country at all events, there is heard a common cry that the academic medical training is extending on the other side into years which should be given to practice; that the expense and duration of a medical education so-called will soon be such as to shut out from the profession many a man who might be a useful physician and perhaps a valuable contributor to the world's knowledge. To remedy this it is advised that the prospective student of medicine should be led from the earliest stages of his training through the paths of exact research into the domain of the natural sciences to the greater or less exclusion of the classics — the old-time humanities, the study of which, useful as it may be from a standpoint of general mental training, is believed by many to be time wasted in the education of the student destined for a scientific career.

But there are not wanting voices which question the wisdom of the full extent of some modern tendencies. May the affectation

of too strict an objectivity bred though it may be of a wholesome skepticism, the more general cultivation of the natural sciences to the exclusion of the humanities, the search for facts and facts alone, circumscribe the powers of synthetical reasoning without which the true meaning of many an important problem might pass unnoticed? May they, perhaps, tend to smother the development of minds capable of grasping large general problems? Do the tendencies of the times justify the epigrammatic observation of a recent French author: "Autrefois on généralisait avec peu de faits et beaucoup d'idées; maintenant on généralise avec beaucoup de faits et peu d'idées" \* ?

That the cultivation of a strict objectivity in research has materially impaired our powers of reason — that the exact methods which are largely responsible for the enormous advances of the last fifty years in all branches of medicine have bred a paucity of ideas, I am not inclined to believe, despite the seductive formula of our Gallic colleague. But that, when, in the period of so-called secondary education, it proposed to *substitute* the study of the natural sciences for a good training in the humanities, there is danger of drying up some of the sources from which this very scientific expansion has sprung, seems to me by no means impossible. The study of the classics, an acquaintance with the thoughts and the philosophies of past ages, gives to the student a certain breadth of conception, a stability of mind which is difficult to obtain in another way. A familiarity with Greek and Latin literature is an accomplishment which means much to the man who would devote himself to any branch of art or science or history. One may search long among the truly great names in medicine for one whose training has been devoid of this vital link between the far-reaching radicles of the past and what we are pleased to regard as the flowering branches of to-day. Greek and Latin are far from dead

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\* Eymin, "Medicins et philosophies," 8°, Lyon, 1903-4, No. IV.

languages to the continental student. They are dead to us because they are taught us as dead. With methods of teaching in our secondary schools equal to those prevailing in England and on the continent, 'twould be an easy matter, in a materially shorter period, to give our boys an infinitely broader education than they now receive. There should be much less complaint of time wasted, much less ground for suggesting the abandonment of the study of branches which are invaluable to any scholarly-minded man.

The assertion that the time spent in the study of the humanities results, in the end, in the encroachment of the academic training upon a period which should properly be given to one's life work is, it seems to me, often based on an old idea—founded all too firmly, alas, on the methods that yet prevail in many of our medical schools—that with his degree in medicine the student has finished a theoretical education, that he must now spend five or ten years in acquiring experience—at the expense, incidentally, of the public—before he can enter into his active life; that, therefore, unless some other branches of early instruction be sacrificed to courses leading more directly to medicine so that he may enter upon his strictly professional education at a period considerably earlier than is now the case, the physician of to-morrow will become self-supporting only at a period so late in life as to render a medical career impossible to other than those well supplied with the world's goods. With proper methods of instruction this is a wholly false idea. Under fitting regulation of our system of medical training, with due utilization of the advantages offered by hospitals for clinical observation, the experience necessary to render a man a safe and competent practitioner should be not only offered, but required for a license to practice; and even if the length of the strictly medical curriculum be extended one or two years beyond that which is at present customary, it would not be time lost. If one but look around him, he will find, I fancy, that few men who have

had such a training wait long before finding opportunities for the utilization of their accomplishments; the public in most instances, soon recognizes the man of true experience.

But there is yet another side of the question which has hardly been sufficiently emphasized, a side of the question which must come strongly to one's mind when he considers the general education of many of the men who are entering even our better schools of medicine, a point of view which has been especially insisted upon by a recent French observer. A large part of the success and usefulness of the practitioner of medicine depends upon the influence which he exerts upon his patients — upon the confidence which he infuses — upon his power to explain, to persuade, to inspire. It can scarcely be denied that these powers are more easily wielded by the man of general culture and education than by one of uncouth manner and untrained speech however brilliant may be his accomplishments in the field of exact science. I can do no better than quote the words of Professor Lemoine; “ C'est qu'en effet l'action morale qu'il peut exercer sur le malade, et qu'il exerce d'autant plus qu'il est supérieur par son intellectualité, est un des principaux éléments de guérison. On guérit par des paroles au moins autant que par des remèdes, mais encore faut-il savoir dire ces paroles et présenter une autorité morale suffisante pour qu'elles entraînent la conviction du malade et remplissent le rôle suggestif qu'on attend d'elles. Ne fut-ce que pour cette raison, je me rangerai parmi ceux qui demandent le maintien d'études classiques très fortes comme préparation à celles de la médecine, car le meilleur moyen de rehausser le prestige du médecin c'est encore de l'élever le plus possible au dessus de ses contemporains.” \*

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\* Indeed the moral influence which he [the physician] is capable of exercising upon the patient and which he exercises to an ever-increasing degree with his intellectual superiority, is one of the most important of therapeutic agents. One heals by words at least as much as by drugs. but one must know how to *say* these words and to exercise a sufficient

These words express, it seems to me, a large measure of truth. May it not be that in the tendency to the neglect of the humanities we are taking a false step? May it not be that if, on the other hand, we teach them earlier and better, we shall find in the end that no essential time is lost, while we shall gain for medicine men not only with minds abler to grasp the larger and broader problems, but with materially fuller powers for carrying on the humbler but no less important duties of the practitioner of medicine?

In that which I have just said I have touched upon the necessity of the requirement of a considerable amount of clinical experience as an essential for the license to practice medicine. To meet the enormously increased demands of the present day, medical education has become, of necessity, much more comprehensive, and must therefore extend over a longer period of time. The methods of research, anatomical, physical, chemical, which the student must master, the instruments of precision with which he must familiarize himself, are almost alarmingly multifarious; and experience in the application of these methods and in the use of these instruments demands increased time. Many of these proceedings, it is true, the physician will rarely be called upon to use personally in practice, for such measures must in great part be carried out by special students or in laboratories provided by the government. Nevertheless, with their significance and value he must be familiar — familiar from personal observation and experience.

But after all there are few diagnostic signs in medicine and

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moral authority, that they may bring conviction to the patient and carry the full weight of suggestion which is intended. Were it but for this reason I should range myself among those who demand the maintenance of extensive classical studies as a preparation for those of medicine, for the best means to uphold the prestige of the physician is still to raise him as far as possible above his contemporaries. Congr s Fran ais de m decine. VI. Session. Paris, 1902, 8 , T. II., p. xli.

not so many of the improved methods of clinical investigation yield diagnostic results, while to familiarize one's self with methods and instruments of precision is a very different matter from acquiring real experience and skill as a diagnostician or a therapist. It is only by gathering together and carefully weighing all possible information that one is enabled to gain a proper appreciation of the situation and approach a comprehension of many conditions of grave import to the patient. And in forming a sound judgment with regard to these vital questions, that which comes from experience in the close personal observation of the sick is far the most important element. Bedside experience constitutes to-day, as it always has, and always will, the main, essential feature in the training of the physician. But this experience, if it is to bear its full fruit, must be afforded to the student at a time when his mind is still open and receptive and free from preconceived ideas — under conditions such that he may be directed by older trained minds into proper paths of observation and study, for few things may be more fallacious than experience to the prejudiced and the unenlightened.

That such experience may be freely offered to the student, there is a grave necessity for a more general appreciation, by institutions of medical training as well as by the powers in control of public and private hospitals and infirmaries, of the mutual advantages to be gained by a cordial co-operation. It must be acknowledged that, in this country at least, despite the cultivation of improved methods of clinical investigation, there still prevails in the mind of the public the perverted idea that this bedside observation, this application of new methods of research and study, are for the advantage of the student or in the interest of general science rather than for the benefit of the sufferer himself. It must further be recognized that a wholly mistaken conception of the true function of a hospital is widely prevalent. It is all too common to see large and ornate institutions with every arrangement for the comfort and even luxury of the patient, with

a medical staff utterly insufficient in number or training to properly study the individual case, not to speak of carrying on scientific investigations — the service, usually under the direction of a busy, driven practitioner with barely time to make a short daily visit — large wards under the direct control of one or two young men whose time is wholly occupied by routine work — every care taken for the present comfort of the patient — little provision for enlightened study or treatment of his malady — no opportunities for a contribution on the part of the institution to the scientific progress of the day. Better far for the sufferer were he in the dingy ward of an old European hospital where he might be surrounded by active inquiring minds recording the slightest changes in his symptoms, ever ready to detect and, as far as the power in them lies, to correct the earliest evidences of perversion of function. What our hospitals need is men, students, whether or no they have arrived at the stage in their career — which, after all, is but a landmark, not a turning point — that entitles them to the right of independent practice, the enthusiastic, devoted student who, in watching and studying the patient, is contributing alike to the interests of the sufferer, the hospital and himself.

The three main functions of a hospital, the care of the sick, the education of the physician, the advancement of science, are not to be met alone by the building of laboratories and operating rooms and lecture halls, by the furnishing of the refinements of luxury to the patient, useful adjuncts though these may be. What the hospital mainly needs is men, men to study and think and work — *students of medicine*.

It cannot be denied that in this respect we in America are behind our cousins of the old world. Despite our many honorable achievements, the part which we are taking in the modern study of the physiology of disease is still not what it should be.

Ere long we must come to realize that our duty to the sick man consists in something more than to afford him that which most



sick animals find for themselves — a comfortable corner in which he may rest and hide from the world ; that our duty to the public is to give them as physicians, men of the widest possible general training, ready to enter upon independent practice with an experience sufficient to render them safe public advisers ; that our duty to ourselves is to miss no opportunity for the study of pathological physiology at the bedside of the patient ; that the accomplishment of these ends depends in great part upon the appreciation by our universities and hospitals of the mutual advantages of co-operation in affording every opportunity for the scientific study of disease while offering to the patient the privileges of enlightened observation and care.

But there are everywhere signs of a future rich in achievement. An improving system of medical education, the increasing opportunities for scientific research offered as well by the generosity of private citizens as by the wisdom of the State and national governments, the community of effort which results from closer fellowship among students of all nations, are omens of great promise. The remarkable developments of the last twenty years in all branches of the natural sciences have brought a rich store of suggestion and resource for application in our laboratory, which is at the bedside of the patient. Let us look to it that our clinical methods keep pace with those which are yielding so abundant a harvest in these neighboring fields of scientific research.

406 Cathedral Street, Baltimore.

Dr. Thayer's article appeared in *Science* for Nov. 25, 1904, and synchronously in *American Medicine*.

## THE PROMOTION OF EARLY DIAGNOSIS IN MALIGNANT DISEASE OF THE UTERUS.\*

BY H. S. CROSSEN, M.D.

The subject of the recognition of cancer of the uterus in an *early* stage is, as you well know, one that has been much written about in the past few years. Various phases of the subject have been investigated in a painstaking way and much good has already been accomplished. But much more remains to be accomplished.

When we remember:

that malignant disease attacks the uterus more frequently than any other organ;

that it is a curable disease, being, in the beginning, local and confined to a part which admits of complete removal;

that the great majority of patients are past cure when they apply for operation;

and that, the refore, there are thousands of lives lost annually that might otherwise be saved, it is little wonder that the workers coming face to face with these cases feel impelled to agitate and agitate for earlier diagnosis.

The practicability of early diagnosis and the urgent necessity for early diagnosis are well established and generally recognized and I do not intend to take your time to-night with these phases of the subject.

The difficulties in the way of early diagnosis are principally two: (1) the want of knowledge on the part of the public generally as to the serious import of irregular blood-tinged vaginal discharges in women approaching the menopause, and (2) the

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\* Read before the St. Louis Obstetrical and Gynecological Society, Jan. 19, 1905.

tendency of physicians to regard these slight symptoms (persistent uterine discharge, with perhaps an occasional streak of blood) as due simply to inflammatory trouble and to treat them accordingly until the malignant infiltration has advanced beyond cure.

Now, the education of the public in this direction is an exceedingly hard task. Of course physicians, as individuals, can help by giving information to their patients. But there is a larger medium of publicity that should certainly be utilized in some way in a matter of such great importance to the public. I refer to the public press and periodicals. This, however, is a delicate matter and one for concerted action only on the part of the profession as a body, and not for individual action. This phase of the subject is already being considered in a practical way and it is hoped that at the next meeting of the American Medical Association the matter will be thoroughly discussed and some definite and effective steps taken for the general dissemination of this much-needed information.

The *second* difficulty is the one I wish to speak of to-night—the difficulty experienced by the physician in making a positive diagnosis in the very early stage, before marked symptoms appear. In connection with this difficulty there are, I think, two ways in which the worker in Gynecology is in duty bound to aid the general practitioner as far as possible—first, by calling attention to the classes of cases in which there *may* be beginning cancer and, second, by placing at his disposal the facilities necessary for making a positive diagnosis in this early stage.

1. *The evidences of beginning cancer of the uterus.* In what cases should it be suspected and, therefore, special pains taken to find or exclude it?

This has been the subject of many papers before medical societies and in medical journals. And properly so, for the more the subject is agitated, the greater the number of physicians to whose attention it is brought. Some of the points in this connection will bear repeating to-night, and in presenting these

points I shall quote from an article published some years ago, in which I gave the result of a search of the mortality records for St. Louis for the preceding five years (241 deaths from cancer of the uterus in that time) and spoke of the urgency of early recognition of the disease and then took up the clinical difficulties in early diagnosis.\*

“How then are we to discharge our responsibilities in this matter? We cannot curette every woman that comes to us, nor excise and examine a piece of the cervix, simply because she might have cancer. What is needed is the adoption of a practical mode of procedure for determining certainly, in patients with uterine disease, whether or not malignant infiltration is present. And it shall be my endeavor to outline such a mode of procedure.

Malignant disease of the uterus means carcinoma or sarcoma. Carcinoma may start from the squamous epithelium covering the cervix or from the cylindrical epithelium lining the canal of the cervix and body of the uterus or from the gland cells situated deeply in the substance of the cervix and body. Sarcoma may start from any part of the organ.

Malignant disease is invariably *chronic* and there is always present either *induration* or *ulceration*.

In the cervix, if there is induration it can be felt. If there is ulceration or erosion of the outer surface of the cervix it can be seen. If there is ulceration within the cervical canal it will cause a troublesome discharge.

In the body of the uterus, if there is ulceration it will cause a troublesome discharge. By “troublesome discharge” I mean what is ordinarily called “leucorrhoea” — not the watery discharge of advanced cancer.

Induration in the body of the uterus can not, of course, be

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\* Early Recognition of Uterine Cancer, by H. S. Crossen, M.D., St. Louis Courier of Medicine, 1900.

detected until a considerable mass has formed. I am satisfied, however, that practically every case of malignant disease of the body of the uterus, whether carcinoma or sarcoma, presents a discharge while the infiltration is still in an early stage — that is, before it has gone beyond the reach of radical operation.

In forming a conclusion as to whether or not a lesion is malignant, we should not give too much weight to the youth of the patient. To be sure, in carcinoma the patient is usually past thirty-five. But carcinoma may occur before thirty. One patient for whom I did an abdominal hysterectomy for carcinoma was but twenty-eight and the disease had then been present long enough to form a large mass and had been giving her much trouble for several months. Several cases of this disease in patients under twenty have been reported. Sarcoma may develop at any age.

Called, then, to see a patient with pelvic disease, if there is no erosion or ulceration of the cervix, no induration of the cervix or body of the uterus, and no chronic pathological discharge, we are safe in assuming that the uterus is free from malignant infiltration. When any of these signs are present we must make a differential diagnosis.

*Induration of the cervix* may be due to cystic disease or to scar tissue from laceration or to a fibroid.

In cystic disease, if the nodule be punctured and then pressed upon, the characteristic clear, glairy substance will be extruded and the induration will largely disappear. If there remains enough induration to make the diagnosis doubtful, excise a small wedge-shaped piece and submit it to a pathologist for examination.

In scar tissue from laceration, the induration is limited to the site of injury and the cause is plain. Also in scar tissue the area of induration remains practically the same, whereas if malignant the area of induration gradually increases. In this case, as in every other, if there is reasonable doubt after a short

period of observation, excise a piece for microscopic examination.

In fibromyoma of the cervix, fibroids elsewhere in the uterus may often be detected, making it probable that the nodule in the cervix is similar in nature. A well-formed tumor in the cervix, even a fibromyoma, should be removed, for almost without exception, a fibroid in that situation causes very troublesome symptoms. A small mass with no fibroids elsewhere, should have a piece excised to make certain the diagnosis.

*Ulceration or erosion of the cervix* may be due to an irritating discharge, to a pessary or other irritant, to eversion of the mucous membrane by laceration, or to tuberculosis, syphilis or chancreoid.

In the first two mentioned the lesion heals promptly on removing the cause.

Where the cervix is torn so deeply that the mucous membrane is everted and granulating, the cervix should be repaired, and the tissue removed in the denudation for repair should be examined microscopically if there is the least suspicion of malignant infiltration. If there proves to be no malignant infiltration, the cervix will be in much better condition than before and we will have satisfied ourselves that it was only simple trouble, and the patient need never know that there was a suspicion of malignancy. If malignant infiltration is found in the excised tissue, the uterus can be removed at once, with the probability of permanent cure.

Tubercular ulceration of the cervix is rare. The diagnosis is made from microscopic examination of pus and scrapings from the diseased area or from a piece of tissue excised.

In syphilitic ulceration there are usually other lesions or a history which makes the diagnosis clear. Furthermore, a syphilitic lesion of the cervix, standing alone, whether primary, secondary or tertiary, should yield within a reasonable time to appropriate treatment.

Chancroidal ulceration when thoroughly cauterized should within a short time thereafter show healthy granulation and rapid healing. A sore on the cervix that resists appropriate treatment should have a piece removed for examination.

A very convenient aid in the differential diagnosis of suspicious areas on the cervix is the following method: Soak a pledget of cotton in ten per cent copper sulphate solution and apply for a minute or two to the suspicious surface. If the lesion is a simple erosion a bluish-white coating will form without hemorrhage. By repeating the application at intervals of three or four days the erosion will soon be healed. If the lesion is an ectropion it will be blanched by the application. If the lesion is cancerous ulceration the copper sulphate application will cause bleeding. A few days later another application is made, and if the bleeding is more free there is a very strong probability of incipient cancer. Heitzman, who brings forward this method, states that he rarely failed to find microscopical confirmation of this provisional diagnosis. In all ulcerations except malignant the bleeding is checked by the copper sulphate solution in a few applications, and the persistence of a single bleeding point after the rest of the raw surface has healed indicates malignancy.

There still remain for differential diagnosis the *diseases causing uterine discharge*. Here is where the difficulties begin and where there have been so many failures. I say many failures, for of the hundreds of women who die annually of cancer of the uterus, I believe that a large number seek medical advice in the early stage and are treated for inflammation of the uterus.

Taking up the differential diagnosis of diseases causing uterine discharge, we know that malignant disease is always *chronic*. So we can eliminate at once all the acute diseases, leaving only the following: —

Chronic endocervicitis (septic, gonorrhoeal, glandular).

Chronic endometritis (simple, septic, gonorrhoeal and tubercular).

Polypi.

Fibromyomata.

In differentiating these affections from malignant disease the effect of treatment is an important item.

Inflammation of the uterus in any form is greatly benefited by appropriate treatment. Consequently every case of uterine disease presenting induration, ulceration or discharge, should be subjected to careful and vigorous treatment for the purpose of differential diagnosis as well as for the purpose of effecting a cure.

In *chronic endocervicitis* a very good plan is to give a hot anti-septic douche two or three times daily, and every second or third day apply a four per cent silver nitrate solution, or tincture of iodine, to the cervical canal.

If there is a marked congestion of the cervix, make multiple punctures.

If the external os is so small as to interfere with drainage, open it by dilatation or incision.

If there are cysts, puncture and evacuate them and touch the cavities with silver nitrate or tincture of iodine or carbolic acid.

If there are polypi, remove them.

If the cervix is hypertrophied and riddled with cysts, excise most of the diseased area and repair the cervix or partially amputate it.

Any tissue removed from the cervix, either curettings or polypi, or pieces removed in denudation for repair, should be subjected to a microscopic examination in every case that is the least suspicious. The simple fact that cystic disease is present does not exclude cancer. Both may be present, and if the pathological discharge persists after a course of treatment, a piece should be excised from the suspicious area.



*Chronic endometritis.* — Simple endometritis — that is, where there is no pus infection — is due usually to poor blood or a malposition or a stenosis or subinvolution or a tumor. Remove the cause, and if the changes in the endometrium are not marked, they will subside spontaneously or after a few astringent applications. If the pathological changes are marked, it is not sufficient to remove the cause, but we must remove also the diseased endometrium, that a new and better one may develop under the bettered conditions. If the case is not perfectly plain, the scrapings should be examined microscopically that the diagnosis may be confirmed or disproved.

In chronic septic endometritis and in chronic gonorrhoeal endometritis, the idea of effecting a cure by long-continued intrauterine applications, repeated week after week and month after month, is a delusion and a snare. These long-continued applications rarely if ever effect a cure, they frequently cause extension of the inflammation to the tubes, and worse still, they deceive the patient and the physician with the thought that something is being done towards a cure — whereas, little or no real progress is made against inflammation, and if malignant disease be present it is allowed to develop till it is past cure.

In all these cases in which the trouble persists after a course of treatment including a few intrauterine applications, the uterus should be carefully cleared out with a curette. Then, if the trouble is only inflammation, the patient is in a fair way to get well, and if the microscopic examination of the scrapings shows malignant disease, the uterus can be removed in this early stage with a well-founded hope of saving the patient's life.

*Fibromyomata* are frequently multiple, and when only a single tumor can be felt it may be of such large size, or have existed so long with but little disturbance, that malignancy is excluded. But there are many cases in which the mass is small and as far as known has existed only a short time. In these cases the most

important point in the differential diagnosis is the change that takes place in the endometrium in the two diseases.

A fibromyoma frequently causes a chronic hypertrophic endometritis which gives rise to discharge and hemorrhage.

A malignant tumor starting deep in the uterine wall may at first cause similar changes, but in the course of time and before it reaches a large size or passes beyond the limit of complete removal, it extends to the endometrium and characteristic elements will be found in the uterine scrapings. Furthermore, the great majority of malignant growths of the body of the uterus *begin* in the endometrium and so produce characteristic changes there in the very earliest stage.

Therefore, in a case of small tumor of doubtful character, accompanied with discharge or bleeding, curettage should be done as a means of diagnosis. If the uterine scrapings do not show malignant infiltration, we are justified in assuming that the tumor is a fibroid, but if the scrapings do show malignant infiltration the radical operation is, of course, indicated at once.

Another point which should be kept in mind is that a malignant tumor which at first causes disturbance of the endometrium by pressure or proximity only, may later send its characteristic elements to the endometrium where they can be reached with the curette. Consequently, when the first examination shows nothing malignant, if signs of marked endometrial disturbance again appear, the diseased tissue should be again removed for examination.

In the later stages also of uterine tumors, curettement is valuable as a diagnostic means. For instance, a patient presents a large tumor of the uterus of doubtful character, with pain and discharge and marked disturbance of the general health. Curettagage will lessen the hemorrhage and discharge temporarily and will furnish tissue for examination. If the scrapings show no malignant infiltration, the tumor is probably a fibroid and removal may be indicated. If the scrapings do show malignant trouble,

only palliative measures are indicated, as complete removal would be impossible.

There remains still unmentioned the one form of malignant disease that is the most difficult of positive diagnosis. I refer to a malignant tumor growing in a fibroid or resulting from the degeneration of the same. In a number of well-authenticated cases malignant tissue has been found in tumors that were undoubtedly for several years simple fibroids. Fibrocystic tumors seem more dangerous in this respect than the solid tumors. The cases are not very frequent, but they do occur, and a fibroid that takes on rapid growth at any time near the menopause is open to this suspicion.

As the malignant infiltration is for a long time confined within the fibroid, it does not reach the uterine canal, and a positive diagnosis can be made only by removal of the tumor."

2. *The facilities for making a diagnosis in the early stage.* The positive diagnosis in this early stage depends largely on the microscopic examination. The truth of this statement has been so thoroughly established by pathological investigation, by clinical experience and by numerous excellent reports that I will say nothing further along that line.

But I want to propose a step which I hope will aid materially in the application of these well-established facts to the reduction of the mortality from this disease.

In order to aid in, and encourage, this early diagnosis, and in order to discharge its full duty in this matter to the physicians in this part of our country, to many of whom the University stands in the relation of Alma Mater, the Gynecological Department of Washington University proposes to insure, for any physician, free of charge, prompt microscopic examination of specimens from any case in which there is a suspicion of cancer of the uterus, and in which the patient is unable to pay the usual examination fee.

As to details, there are several points to consider.

1. The classes of cases requiring such an examination. These have been pointed out in the previous pages.

2. Securing and preserving specimens. The methods of securing specimens from the cervix and from the interior of the uterus have also been mentioned to some extent.

In some cases a small piece of tissue can be clipped from the affected area on the cervix with but little discomfort to the patient. In other cases it is best to inject a small amount of cocaine solution and to excise a distinct wedge-shaped piece about a centimeter in width, the resulting wound being closed by one or two sutures to prevent bleeding.

The specimen should if possible include part of the margin of the affected area, that the process, whatever it is, may be studied as it invades the surrounding tissue.

In regard to specimens from the interior of the uterus, in a few cases the cervical canal is so large and so easily dilated that, with a small curette, scrapings from the endometrium may be obtained without causing the patient much pain. In most cases, however, of persistent disease in the interior of the uterus, a curettement under anesthesia is preferable. In such curettement the whole interior of the uterus is gone over thoroughly and, consequently, if all the scrapings be examined the diagnostic significance of the findings is much greater, particularly in the direction of excluding cancer. Furthermore, if the trouble proves to be only inflammatory, this thorough curettement under anesthesia is then of decided therapeutic value, as previously explained.

The preservation of specimens for microscopic examination is ordinarily a very simple procedure, and yet, in many doubtful cases, curettings or cervical polypi removed or pieces of tissue passed spontaneously, are thrown away, or kept in such a way that they are not fit for microscopic examination. All such specimens, as soon as possible after removal and without unnecessary handling, should be carefully washed to remove blood-clots

and then immediately dropped into a bottle containing 95 per cent alcohol or 10 per cent formol. Either of these preparations is a good preservative and in it the specimen may at once be forwarded.

Remember that in a diagnostic curettement, *all* the scrapings should be saved and examined.

3. Sending specimens. Accompanying the specimen should be a label or note, giving the name and address of the physician, the patient's age and initials, the date on which the specimen was secured, the exact situation from which the specimen was removed, and the prominent symptoms.

The small bottle containing the specimen may be placed in a mailing tube and mailed to the Gynecological Department of Washington University Hospital, Jefferson and Lucas Avenues, St. Louis.

Now, I feel that the crusade for the reduction of the mortality from cancer of the uterus, which is now being carried on in this and other countries, should receive every possible encouragement and assistance.

The measure which I have proposed to-night, I regard as a definite and practical step in this direction and in the solution of this important and vexing problem — the early recognition of uterine cancer.

## SURGERY OF TYPHOID PERFORATION.

BY EDMUND A. BABLER, M. D.

Perhaps the most formidable and seldom or late diagnosed complication of typhoid fever is perforation of the bowel. Previous to the valuable and inspiring memoir of the worthy v. Leyden<sup>1</sup> this complication was seldom recognized, and these patients were permitted to die unaided. V. Mikulicz<sup>2</sup> was the first surgeon fully to appreciate the assertions of Leyden and to possess the necessary courage to operate. On April 7, 1884, Mikulicz performed the first recorded operation for the relief of the symptoms of perforation of the bowel. A median incision revealed potato floating in the patient's belly. Convalescence was tedious and protracted, but recovery eventually complete.

To Professor J. T. Wilson<sup>3</sup> is due the honor of having been the first American to call attention to the subject and advise early operation. His painstaking and persistent labors are worthy of the highest praise. His prophetic words will be referred to later.

In 1887 Bontecou<sup>4</sup> operated 36 hours after perforation but the patient died. One year later Wagner<sup>5</sup> reported a successful case. Escher,<sup>6</sup> Senn,<sup>7</sup> and Van Hook<sup>8</sup> recorded cases about this time. Some writers maintain that Van Hook reported the first successful American case. Gradually the profession has come to appreciate the fact that every case of typhoid fever must be closely watched and that perforation is an ever-present danger of the greatest significance.

## FREQUENCY.

Perforation is of more frequent occurrence than most of the members of the profession have appreciated. It is quite probable that many cases have been diagnosed as intestinal hemorrhage.

Dr. Osler<sup>9</sup> states that 25 per cent of the fatal cases of typhoid fever are due to perforation, while Dr. Briggs<sup>10</sup> place the figure a trifle higher. Mackenzie agrees with Dr. Osler, while Dr. Fitz<sup>11</sup> maintains that 6.58 per cent. of all cases of typhoid fever suffer perforation. In order to find the number of cases of perforation that have occurred in this city during the past six years, I consulted the city's statistics which revealed the fact that during the past six years 1,230 persons had died from typhoid fever. During these years 6,832 cases of typhoid have been reported to the Health Department,<sup>12</sup> but this figure is too small since many cases are not reported. It is certain, however, that there have been 1,230 deaths. Now if Dr. Osler's assertion be true, it is then evident that more than 300 of these cases died from perforation!

Assistant Health Commissioner Francis<sup>13</sup> has informed me that he does not remember ever having seen a death certificate with the diagnosis of perforation of the bowel as a cause of death. I then wrote to perhaps 30 of the busy practitioners of this city, and also searched all available literature for reported cases, to see how many of these 300 had been diagnosed, but was able to collect only 35 cases. During a recent discussion at a meeting of the City Hospital Alumni Medical Society, several prominent physicians<sup>14</sup> with a very large private and consulting practice stated that they had seen very few, and in some instances, no cases.

In 685 cases of typhoid treated at the Johns Hopkins Hospital, Dr. Osler found perforation in 34. In 1555 cases at the Presbyterian Hospital,<sup>15</sup> perforation was found in 47. The records of the Mullanphy Hospital during the past five years do not contain a case.

#### PREDISPOSING CAUSES.

*Race.* — It is worthy of mention that only five or six cases of typhoid perforation in the negro have been recorded. It

seems certain, however, that race *per se* is not a predisposing cause.

*Age.* — Typhoid fever is a disease of youth and early adult life. Dr. Holt<sup>16</sup> has never seen a case of typhoid under 5 years of age. Dr. Jopson's<sup>17</sup> patient, in whom perforation occurred, was about 6 years of age. Dr. Elsberg<sup>18</sup> has reported a similar case. It is very questionable whether age is a predisposing cause. Personally, I believe that more cases are seen during early adult life simply because typhoid is more frequent at this time of life.

*Sex.* — Without doubt females are less susceptible to perforation than males. Dr. Finney<sup>19</sup> states that perforation occurs three times more frequently in males than in females. Drs. Harte and Ashhurst consider that 80 per cent of typhoid perforations occur in males. These statistics are of very great significance when we remember that typhoid fever, as a rule, occurs as frequently in females as in males. Dr. Fitz collected 100 cases of perforation in 71 of which the patient was a male.

*Intestinal parasites* may predispose to perforation. Virulent cocci or bacilli may induce a secondary infection resulting in inflammation and necrosis. A severe inflammatory process in one of the ulcers may follow an invasion, and perforation follow.

*Stage of the disease* is an undoubted predisposing cause. By far the greater number of perforations occur during the second, third and fourth weeks. It may occur at any time but especially during the latter part of the second and beginning of the third week — at the height of the disease — as pointed out by Dr. Osler. Perforation may occur before the patient feels sick enough to go to bed or during convalescence when the every danger seems past.

Of 353 tabulated cases perforation occurred as follows: —



	WEEK OF DISEASE.						WEEK AFTER RELAPSE.		DURING CONVALESC.	Total.
	1	2	3	4	5	6	6	after 6th week.		
Platt <sup>20</sup>		16	33							49
Shattuck W. & Cobb <sup>21</sup>			5	8	4	1				18
Harte & Ashhurst <sup>22</sup>	6	59	103	44	25	6	16	15	11	286

It is thus evident that perforation is greatly influenced by the stage of the disease.

*Severity of the disease.* — The severity of the individual attack is an important factor. Drs. Keen,<sup>23</sup> Platt, Fitz, and others, contend that there is absolutely no definite relation between the severity of the individual attack and the occurrence. Dr. Osler maintains that perforation occurs more frequently in the severe cases. In half of the cases of perforation occurring at the London Hospital the attack of typhoid, according to Mackenzie,<sup>24</sup> was mild. In fifteen of the eighteen cases reported by Drs. Shattuck, Warren and Cobb, the attack was also mild. It must be remembered that when the attack has been mild the patient is frequently permitted to act indiscreetly, thereby favoring perforation. A careful study of the pathology would seem to indicate that during the height of a severe attack perforation is especially likely to occur.

*Intestinal hemorrhage* lowers the patient's vitality and causes increased peristalsis. Dr. Nietert<sup>25</sup> believes that intestinal hemorrhage is an indication of a rapid ulceration and that these cases are worthy of the most careful attention. Personally, I do not consider perforation and hemorrhage coincident. It is true that it is not uncommon to have perforation follow a severe hemorrhage. The depth of the necrosis may have just extended through

the coat of the blood-vessel. Hemorrhage will then accompany or follow the separation of the necrosed tissue.

Season can not be considered a predisposing cause. More cases of perforation occur during the summer and autumn simply because typhoid is more prevalent at this time. Season, *per se*, is not a predisposing factor.

#### EXCITING CAUSES.

The exciting causes are chiefly mechanical. Any undue exertion causing a sudden involuntary contraction of the abdominal muscles may be the exciting factor. It may be due to undue straining at stool or during urination. Sudden spasm of cough may induce it. In one of Dr. Nietert's cases it followed the removal of the patient from her residence to the hospital. Non-digested food was the exciting factor in one of Dr. Dalton's<sup>26</sup> cases. Numerous cases have been reported in which corn-bread, graham-bread, oatmeal, and other coarse and irritating foodstuffs have induced severe intestinal hemorrhage — in some of which perforation was perhaps the cause of death. It is almost beyond cavil that placing a typhoid patient in too cold a tub-bath may be the cause of perforation, by the sudden, almost involuntary, contraction of the abdominal muscles thus induced. When perforation occurs while the patient is sleeping it is probably due to the extensive necrosis.

#### SITE OF PERFORATION.

Perforation may occur in the gall-bladder, appendix, cecum, colon, ileum, Meckel's diverticulum, or any part of the intestinal tract. In by far the greater proportion of cases, however, it occurs in the last foot or eighteen inches of the ileum. In 220 collected cases it occurred in the last eighteen inches of the ileum in 168, while in a very few it was more than three feet from the

ileocecal valve. Dr. Fitz has found that perforation occurs in the ileum in 81 per cent. of the cases.

#### SIZE OF PERFORATION.

As a rule the perforation is quite small, but Dr. MacLagan<sup>27</sup> mentions cases in which the hole could more fittingly be described as a sloughing of all the coats of the intestine. In Dr. Stewart's<sup>28</sup> patient it was as large as a silver quarter. Dr. Osler has found that the higher in the bowel the more likely is the perforation to be in a small ulcer without much infiltration or necrosis of the wall; the earlier the perforation the closer the valve and the greater the risk of a widespread necrosis of the mucosa. Cases have been reported where the opening was so large that resection was necessary. Of 180 collected cases the perforation was less than one-eighth inch in 79; less than half an inch in 88, and more than half an inch in the balance. In ambulatory cases the perforation is usually large. It is seldom that an entire Peyer's patch sloughs away, it being far more common to find a pin-head size perforation.

#### SHAPE OF PERFORATION.

Frequently with ragged edges. May appear as a black spot. As a rule the perforation is oval or round — when it occurs in the cecum it is usually oval or oblong with undermined edges. In ambulatory cases there may be five or six perforations of various sizes and shapes. In some instances there is a slit-like opening, usually regarded as due to traumatism.

#### PATHOLOGY.

In typhoid fever the pathological lesions are especially prominent in the lower part of the ileum. In the cecum and ascend-

ing colon may be found extensive lesions. At the beginning there is a hyperemic condition of the mucosa and follicles of the lower ileum. The great increase and accumulation of cells of the lymph tissue may be so extensive that the adjacent mucosa becomes infiltrated — and the blood vessels becoming more or less compressed, causes the follicles to assume a whitish, anemic appearance. There may be an appreciable round-cell infiltration. If the so-called medullary infiltration does not resolve, coagulation necrosis follows and the affected area becomes discharged into the bowel. The process is aided by the direct action of the typhoid toxins and also by the ischemia due to the altered blood supply. Recently, the typhoid toxins have been regarded as the agents producing the agglutination-thrombosis of the erythrocytes in typhoid. It has also been stated that the thrombosis predisposes to sloughing. When the medullary infiltration involves the entire thickness of the bowel it is evident that a perforation will occur when the necrotic area is separated. The slough may involve only the mucosa, or as is the more common, involve the tissues down to the muscularis. The slough is cast about the end of the second or beginning of the third week. Separation begins at the edges of the necrosed area. It is quite rare to find an entire Peyer's patch slough away, or to find a perfectly ovoid (?) ulcer directly opposite the mesentery attachment. When the ulcer fails to heal and gradually deepens, as it approaches the peritoneal coat it may induce more or less plastic peritonitis. As a rule, however, it is rare to find adhesions, and even if present, they are usually very feeble. A tag of omentum may be adherent to the bowel at site of perforation. Such a case has been recently reported by Dr. Brown.<sup>29</sup> If the process continues an abscess may form and necessitate subsequent incision. Dr. Holmes<sup>30</sup> has reported such an instance. In one of Dr. Bernays' <sup>31</sup> cases an abscess had formed. Monod and Van Verts<sup>32</sup> have seldom or never found firm adhesions when the ileum was the site of perforation. Patches of lymph often sur-

round and may even obscure the opening. Dr. Thayer<sup>33</sup> has found that the mesenteric lymph glands usually correspond in their size to the degree of intestinal inflammation, for hyperemia, edema, fatty degeneration, suppurative softening or resolution in the nodes usually follow similar changes in the patches. The nodes first affected lie in the angle between the lower end of the ileum and the ascending colon; later on those near the root of the mesentery are involved; peritonitis may follow from suppuration in them.

“PREPERFORATIVE STAGE.”

By this term Dr. Cushing<sup>34</sup> referred to the whole period from the first involvement of the serosa with the customary formation of adhesions at that point, until these adhesions which may for a time constitute the floor of the ulcer after the serosa has given away, have themselves become broken down and a general extravasation has taken place. This period may last a longer or a shorter time and is associated with pain and tenderness, and a possible rise in leucocytosis owing to the localized peritonitis. He regards the “preperforative stage” as the time when operation should be performed. The researches of Drs. Shattuck, Warren and Cobb tend to favor the existence of a “preperforative stage.” They conclude that in the majority of cases of perforation certain premonitory symptoms will be recorded at a time more or less remote from the severe symptoms which induced the consultation. Drs. Wilson and Ross, Shoemaker, and McCrea, have reported cases in which there seemed to be a “preperforative stage.” Personally, I do not believe that a “preperforative stage” will be noted in those cases in which the medullary infiltration has involved the entire thickness of the bowel. I believe that it is in these cases that the perforation occurs suddenly and while the patient is resting quietly. In those cases where the ulcer gradually deepens, inducing a plastic peritonitis the “preperforative stage” may be observed. Dr. Osler does not

pin much faith in the "preperforative stage." Drs. Harte and Ashhurst doubt whether it can be recognized as a pathological any more than as a clinical entity, because so often there may be a certain degree of peritonitis without any microscopic evidence of a perforation.

#### SYMPTOMS.

There are no pathognomic symptoms of typhoid perforation. In some instances there may be no symptoms suggestive of perforation. Drs. Dandridge, Murphy, Deaver and others have reported cases in which the patient presented practically all of the usual manifestations of perforation, but celiotomy failed to reveal any evidence of same. As a rule, however, the closely followed and carefully attended cases will present certain symptoms which will lead us to a correct diagnosis.

Among the important and more or less constant symptoms of perforation are the following:—

*Pain.*—Sensory nerves are distributed to the peritoneal coat, and it is quite probable that pain will be present if perforation occurs. In fact, sudden, severe pain in the lower right quadrant of the abdomen is one of the most frequent and important symptoms of typhoid perforation. It may be referred to the penis, rectum, or umbilicus, and is usually paroxysmal and stabbing in character. In one reported case the pain was confined to the penis and the night orderly catheterized the patient; the pain subsided but within a few hours there appeared severe paroxysmal pain in the abdomen accompanied by the usual manifestations of peritonitis. In several instances the sudden pain followed straining at stool but was limited to the rectum until peritonitis had developed, when it shifted to the abdomen. Drs. Shattuck, Warren and Cobb do not deem it possible too forcibly to emphasize the fact that abdominal pain, especially if localized, complained of by the patient in the mild or moderately severe type of typhoid, is not a frequent occurrence unless it

means peritoneal infection, localized or general. By pain is not meant the discomfort or uneasiness complained of as a result of meteorism or distention by gas. When the pain occurs during a quiet sleep or during a bath, or as a result of severe straining, the pain will be very severe (in many cases at least).

Pain may not be complained of owing to the obtunded condition of the patient. Below will be found a summary of the collected cases in which pain was a prominent symptom:—

	ABDOMINAL PAIN.			REFERRED PAIN.		Total.
	Sudden and Severe.	Gradual and Not Severe.	Slight or None.	Referred to Rectum.	Referred to Penis.	
Allyn, <sup>35</sup> .....	1	.....	.....	.....	.....*	1
Barrs & Thompson, <sup>36</sup> ..	1	.....	.....	.....	.....	1
Bartlett, <sup>37</sup> .....	1	.....	.....	.....	.....	1
Baumgarten, <sup>38</sup> .....	.....	1	.....	.....	.....	1
Bennett, <sup>39</sup> .....	1	.....	.....	.....	.....	1
Bowley, <sup>40</sup> .....	1	.....	.....	.....	.....	1
Bernays, <sup>41</sup> .....	.....	2	.....	.....	.....	2
Briggs, <sup>42</sup> .....	3	2	.....	1	.....	6
Brown, <sup>43</sup> .....	2	.....	.....	.....	.....	2
Cutler & Elliot, <sup>44</sup> .....	1	.....	.....	.....	.....	1
Cushing, <sup>45</sup> .....	8	4	.....	.....	.....	12
Davis, <sup>46</sup> .....	1	.....	.....	.....	.....	1
Dalton, <sup>47</sup> .....	2	.....	.....	.....	.....	2
Drury & Taylor, <sup>48</sup> .....	1	.....	.....	.....	.....	1
Elsberg, <sup>49</sup> .....	15	.....	.....	.....	.....	15
Finney, <sup>50</sup> .....	3	.....	.....	.....	.....	3
Hawkins, <sup>51</sup> .....	1	.....	.....	.....	.....	1
Hays, <sup>52</sup> .....	7	.....	.....	.....	.....	7
Hill, R., <sup>53</sup> .....	3	.....	.....	.....	.....	3
Heuston, <sup>54</sup> .....	1	.....	.....	.....	.....	1
Jones, <sup>55</sup> .....	1	.....	.....	.....	.....	1
Jopson*,.....	1	.....	.....	.....	.....	1
Le Conte, <sup>56</sup> .....	2	1	.....	.....	.....	3

\* Previously quoted in article.

	ABDOMINAL PAIN.			REFERRED PAIN.		
	Sudden and Severe.	Gradual and Not Severe.	Slight or None.	Referred to Rectum.	Referred to Penis.	Total.
Mallett & Deansley, <sup>57</sup> ..	1	.....	.....	.....	.....	1
McCree, <sup>58</sup> .....	7	8	.....	.....	3	13
Mackenzie*.....	68	6	2	.....	.....	76
Manges, <sup>59</sup> .....	14	2	.....	.....	.....	16
MacLagan*.....	1	.....	.....	.....	.....	1
Miller, <sup>60</sup> .....	1	.....	.....	.....	.....	1
Munro, <sup>61</sup> .....	9	6	.....	.....	.....	15
Nietert*.....	4	.....	.....	.....	.....	4
Platt*.....	2	.....	.....	.....	.....	2
Pentry, <sup>62</sup> .....	1	.....	.....	.....	.....	1
Ricketts, <sup>63</sup> .....	1	.....	.....	.....	.....	1
Reder, <sup>64</sup> .....	1	.....	.....	.....	.....	1
Sayer, <sup>65</sup> .....	1	.....	.....	.....	.....	1
Stewart*.....	6	.....	.....	.....	.....	6
Sallesby, <sup>66</sup> .....	1	.....	.....	.....	.....	1
Shoemaker*.....	1	.....	.....	.....	.....	1
Steer, <sup>67</sup> .....	3	.....	.....	.....	.....	3
Thornton & Godwin, <sup>68</sup> ..	1	.....	.....	.....	.....	1
Wilson & Ross, <sup>69</sup> .....	1	.....	.....	.....	.....	1
Total.....	181	27	2	1	3	214

\* Previously quoted in article.

NOTE: Since writing the above Dr. Behrens informs me that he has seen three cases in which severe abdominal pain was a prominent symptom.

Drs. Brown and Kirchner have each reported a case.

*Vomiting* is not a constant symptom of perforation, being present in only about 22 per cent. of the cases. In Dr. Shoemaker's patient it was present several hours before perforation occurred — in fact Shoemaker mentioned it among the symptoms of the "preperforative stage" which seemed to be present. It seems that there may be some direct relationship between the



severity and persistency of the vomiting and the quantity, virulency and location of the escaped bowel content. Persistent vomiting associated with sudden paroxysmal abdominal pain is a serious symptom and deserves the most careful and thorough investigation, and constant attention. When the perforation is very minute and very little or no feculent, slightly irritating material has escaped there may be no vomiting until peritonitis develops. When the perforation is large and scybalae and liquid feculent material have escaped into the peritoneal cavity, vomiting is usually severe and persistent. In reviewing the literature I have been impressed with this finding. As before stated persistent vomiting is a very grave symptom. Its absence, however, must not be considered as indicative that no perforation has occurred.

*Temperature.* — There is usually a sudden change in the temperature. A sudden rise or a sudden drop, or a drop followed by a rise or *vice versa* is of great significance and demands the most careful consideration. In two of Dr. Briggs' cases the temperature presented no sudden change, while in fourteen of Dr. Finney's cases there was a decided fall noted. Dieulafoy<sup>71</sup> regards a sudden fall in the temperature an infallible sign of perforation. Dr. Le Conte considers a drop of frequent occurrence in perforation. In Dr. Reder's case the sudden pain was accompanied by cold extremities and cold clammy sweat. It is worthy of note that any sudden change in the patient's temperature should be reported immediately to the physician, who should at once make a thorough examination and watch the patient closely.

There may be a change in the *solubility of the bowels*, as noted by recent writers. If the bowels have been constipated they are now loose; if previously loose they may become constipated. This seems to be a very uncertain sign and demands further observation.

*Pulse.* — The pulse is a valuable landmark. As a rule it shows

a change in quality and rate soon after perforation. Increased rate, however, does not always follow within a few hours. Mackenzie considers it very significant if the pulse during a few hours following the attack of pain, becomes more rapid, running and feeble. Increased pulse rate was present in twelve of Dr. Manges' sixteen cases; in Dr. Briggs' six cases; in one of Dr. Miller's and in twelve of Dr. Munro's. It was a prominent feature in many of the cases recorded in the literature, and Dr. Briggs considers the pulse an indication of the greatest importance and deserving of special consideration. If associated with sudden pain, or change in the temperature it becomes of vital importance. In every instance *a sudden increase in the pulse rate should command a careful investigation and the patient should be constantly watched.*

*Delirium.* — May be present before perforation occurs. As an indication of perforation it seems of little value. In reviewing the literature we do not remember having met an instance where delirium followed immediately after perforation. It must be remembered, however, that the patient may be so severely obtunded that the usual manifestations of perforation may be readily overlooked. Delirious patients have gotten out of bed and walked about, and when perforation followed, death closed the scene. Delirium may be a symptom of the peritonitis induced by the perforation.

*Facial expression* is ever a valuable indication of the patient's condition. Any sudden change in the facial expression demands careful consideration. In some instances the change is quite marked and readily detected. The patient whom we left an hour ago, looking cheerful and in apparent good spirits, is now restless; the expression is anxious and it is evident that something wrong has happened; the features may be pinched, the eyes sunken, or the lips pale. In four of Dr. McCrea's cases there was a prominent change in the facial expression. In Dr. Saleeby's patients the expression was drawn, anxious and dis-

tressed. In delirious patients the change may not be so characteristic or at least not so readily noted. In many cases the changed expression seemed to accompany the perforation, while in a few it developed a few moments later. This was especially prominent in all of Dr. Roland Hill's cases.

*Rigidity.* — It must be remembered that the surgeon and the physician have different ideas as to the meaning of "rigidity" — they are practically two different things. The rectus abdominis does not have to be as rigid as it is in suppurative peritonitis before rigidity can be detected. *Rigidity is a very important sign and is usually present early.* Dr. Briggs, and others, regard it as the most important of all the physical signs. Muscular spasm is certainly a valuable finding. It may not develop for several hours after perforation has occurred; it may be due to pleural pain and indicative of pneumonia. In some instances rigidity has not been observed. To detect rigidity it seems needless to say that the entire palmar surface should be in contact with the abdominal wall — the finger-tips alone should not be employed.

*Tenderness*, according to Mackenzie, is next to the most frequent accompaniment of perforation. If complained of previous to the onset of abdominal pain, it becomes intensified. In some instances the point of greatest tenderness is in the region of the perforation while in others it is variable. The position of the terminal loop of the ileum would seem to explain the fact that tenderness is usually most severe on the right side (Osler). In one of Dr. Brown's patients there was an area of great tenderness on the left side of the abdomen and at the operation the perforation was found in the latter situation. When the tenderness is associated with pain and muscular spasm, and has not previously existed, it becomes of especial importance.

*Dullness* is a very uncertain sign of perforation. Suddenly developed changeable dullness in the flanks is a sign of great significance but its absence does not mean that perforation has

not occurred. A diminution of the area of hepatic dullness in the axillary line may be due to the distention of the bowel, but when there is a sudden ballooning of the abdomen as it were, shortly after the onset of severe abdominal symptoms, the area of hepatic dullness may be almost entirely obliterated and the presence of free gas in the peritoneal cavity is a fact. Dr. Connell's method for the detection of free gas in the peritoneal cavity cannot be recommended. The dullness may be noted in the left lower quadrant of the abdomen, and when accompanied by pain and tenderness, the perforation has probably occurred in this area.

*Altered respiration* is usually a late sign and is indicative of the subsequent peritonitis. As an early sign it has seldom or never been observed.

*Collapse.* — Until recently, collapse was described as an early sign but it is now regarded as due to the peritoneal infection. Dr. Murphy<sup>70</sup> maintains that there is little or no depression immediately after perforation, and no collapse. He considers the collapse as a late manifestation, and an expression of the "blistering" of the peritoneum and absorption of the products of infection. In some cases where the patient is severely obtunded and weakened, and there is a quantity of virulent bowel content poured out into the peritoneal cavity the degree of shock will be quite severe.

*Leucocytosis.* — To be of the utmost value an hourly blood count should be made in all patients presenting any symptoms indicative of impending perforation, or in whom a perforation is feared. Of course the general practitioner can not do this. In well-regulated hospitals, however, there is absolutely no reason why it should not become a custom. In typhoid there is a leucopenia but just as soon as an inflammatory complication arises, a leucocytosis results. Some authorities doubt whether perforation itself causes any change in the white count, but Dr. Keen attaches considerable importance to the increased white count. Dr. Osler contends that in well-followed cases there will be found

a rise ; a decided drop of the reds might indicate hemorrhage. Dr. Cushing has reported an interesting case of dysentery in which perforation occurred. One hour previous to perforation the white count was 47,000 : one hour after it was 41,000, and one hour thereafter it registered 30,000. He thinks that a decrease is of more serious import than a rise. A single blood count after perforation is not satisfactory, since in some cases a rise and in others a fall, while in a few, no change has been noted. It may be stated, however, that a white count of more than 15,000 is indicative of the utmost significance, and if associated with pain, and high pulse rate, demands exploratory incision. It is to be hoped that these cases will be more closely studied as to the blood changes, since more complete data are needed.

*Edema* of the abdominal wall has been noted in a few cases, but its absence is of no import. In fact, it cannot be designated as an important or constant sign. Cases have been reported in which it was an accompaniment of pancreatic abscess.

#### DIAGNOSIS.

In some cases a positive early diagnosis is impossible. It is quite probable, however, that many cases have been seen in which the early symptoms were not duly appreciated. Personally, I believe that if the general practitioners would insist upon the taking of careful, constant, and complete bed-side notes in every case of typhoid fever a far greater number of these cases would be seen by the surgeon, and at a time when surgery promises so much. It is here that I would urge the general practitioners to teach the common-sense mother or friend of the patient how to take the pulse and temperature, and to record the same every three hours — and immediately if there occurs any sudden change in the patient's condition ; the quantity and character of nourishment ; the character and quantity of the excreta ; any change in the patient's condition ; duration of sponge bath,

and the effect of the latter; hours of sleep—in a word teach her to be ever on the watch, and to record everything that has been done for, by and to the patient. By so doing the patient's progress can be noted at a glance and greater care and attention will be accorded the patient, while the relatives will readily see that the physician is doing everything possible—his sacred duty. *I plead for the bed-side notes.* Dr. Keen believes that if pain, fall in temperature and a rise of leucocytes to 15,000 or even 50,000 be present, then you ought to conclude that there is a perforation. Drs. Shattuck, Warren and Cobb conclude that pain, associated with local tenderness and muscular spasm, and a rising leucocyte count, points, in most cases, to an operation; in all to a surgical consultation. Dr. Osler maintains that sudden pain, increasing in intensity and recurring in paroxysms, associated with an increase of the pulse rate, distention of the abdomen, increasing pain on pressure, and a rise in the leucocytes, a probable diagnosis of perforation should be made.

A hasty diagnosis should never be made. Every symptom and sign must be carefully considered, and tenderly yet thoroughly investigated. The patient should not be unnecessarily fatigued or excited because, if perforation has occurred, it simply causes further pouring out of the intestinal content. All of the usual symptoms must not be expected to be present in an individual case. In Drs. Cutler and Elliot's patient the prominent symptoms were constant pain, pinched expression and marked rigidity. Mackenzie contends that if it be found on examination that there is no tenderness, that the abdominal wall is flaccid and soft, and moves freely with respiration, that the liver dullness is normal in extent, and that the flanks are resonant, then one may rest assured that as yet no perforation has occurred. This statement is worthy of careful consideration. In making a diagnosis Dr. Briggs relies on the presence of pain, sensitiveness, muscular resistance, altered respiration, alteration

in the rate and volume of the pulse, and evidence of systemic shock. It is well to remember that systemic shock may be very slight and transitory. As before stated there seems to be a direct relation between the degree of shock and the virulency and quantity of the escaped bowel content. The patient's general condition must also be remembered. A characteristic case of typhoid perforation would be succinctly depicted as follows: The patient, usually a young adult male, is in the end of the second or the beginning of the third week of typhoid; the attack has been moderately or quite severe; delirium and vomiting have been absent; patient takes liquid nourishment every three hours; orange juice or egg-albumen ad libitum; sponge-baths reduce the temperature one or two degrees and are well borne; morning temperature 101, pulse 98; evening temperature 104, pulse 110 to 120; bowels are moved every third day with small, non-forcible enema of soapsuds; patient in fairly good condition; abdomen not much distended; patient is somewhat restless but sleeps quite well; in fact we consider him to be doing fairly well or satisfactorily. During the night while sleeping he is suddenly awakened with a severe, stabbing, paroxysmal pain in the right lower quadrant of abdomen; the pain may cause him to scream out and toss about; he complains of feeling cold; temperature may show a sudden drop to normal or even subnormal; extremities are cold and covered with a clammy sweat; pulse shows diminished volume and increased rate (140 to 160); patient's expression is distinctly changed, being now anxious and distressed, or it may be pinched and the lips blue; it is evident that something wrong has happened. Gradually the hot applications and words of assurance have somewhat soothed the patient; the pulse continues high and the temperature may now register 100 to 101; abdomen shows increased distention; the axillary linear dullness shows diminution; the pain continues severe and cramp-like; some tenderness and rigidity in right lower quadrant of

abdomen; rectal examination shows rectum practically empty; no blood or impacted feces; bed-side notes show that patient urinated freely two hours previous to onset of symptoms, and that flatus was also noted; the temperature now registers 104, pulse 160, vomiting slight; patient's expression still continues to be very anxious and distressed; respiratory organs apparently in good condition; no pain or tenderness in the right hypochondrium, tenderness seems especially prominent in the region of the outer border of the right rectus, midway between umbilicus and pubes; gradually the symptoms of the resulting peritonitis develop; vomiting becomes persistent; the abdomen very tender; right rectus rigid; patient protects abdomen as much as possible; patient continues to complain of the pain, but as the disease progresses the senses may become obtunded and collapse and death follow in due time. I cannot too strongly impress the fact that every typhoid patient demands the closest and best care and attention. Any sudden change must be investigated immediately, and the possibility of perforation must be ever remembered. The pain may be referred to the bladder, rectum, umbilicus, or groin — make it a rule to examine the patient when pain, especially if cramp-like, stabbing, and paroxysmal be complained of. Above all do not administer morphine or apply hot stupes and let the matter pass until peritonitis manifests itself. *Morphine cannot be too strongly condemned in typhoid fever. Seek the cause of the sudden changed condition of the patient.* If the shock has been due to intestinal hemorrhage there will be evidences of same within an hour or so, Bear in mind that the sudden drop, or sudden rise, in the temperature may not have been noted; the drop may have lasted but a little while and have been followed by a rise. In some cases a severe chill preceded or followed perforation.



## DIFFERENTIAL DIAGNOSIS.

It may be impossible to differentiate perforation from *appendicitis*. In the latter, however, the pain is seldom so severe; the temperature shows no sudden, severe change; pulse is not so rapid; the expression is not so strikingly changed; and there is usually a history of previous attacks. In any case, operation is indicated.

In *intestinal hemorrhage* the pain is not so severe and, in fact, is seldom present; there is no muscular rigidity and blood will be passed by the rectum in the course of an hour or two; a small rectal enema may detect its presence sooner. Dr. Cushing believes that in some cases intestinal hemorrhage may be amenable to surgical interference.

In perforation of the *gall-bladder* the pain and other symptoms are more localized in the right hypochondrium. Jaundice may be present, and the temperature does not show such a sudden change while the shock is less severe and the pulse less rapid.

Dr. Rose<sup>71</sup> reported a case of *intussusception* occurring in typhoid fever. The differential diagnosis should not be difficult.

In *intestinal obstruction* the bowels are constipated; not even flatus has passed; temperature shows no sudden severe change and the pulse is likewise less rapid; distended intestinal coils may be noted; vomiting may be a prominent symptom. In Dr. Cushing's patient it was noticed that the irrigating fluid which preceded the administration of the nutrient enema, was returned unchanged, while previous to the time of collapse it was returned with a fecal color.

In *iliac thrombophlebitis* pain and sensitiveness in the groin and along the femoral vein for some distance are noted. In some cases, it is impossible to differentiate *mesenteric* thrombosis, but in either instance surgery offers practically the only hope. Dr. Jackson and others<sup>72</sup> have carefully and thoroughly studied

the subject of mesenteric embolism and their valuable memoir is worthy of the most careful study and consideration.

#### PROGNOSIS.

In every case of perforation the prognosis is very grave. Not more than five per cent of the non-operated cases recover. When the perforation occurs in some quiet nook of the abdomen and very little bowel content has escaped, and a tag of omentum seals the parts, the prognosis is more favorable than in those cases where the perforation occurs in some freely moving portion of the bowel. That a *few* cases of perforation recover without operation no one can question. In Dr. Holmes' patient the perforation was followed by abscess formation. Dr. Osler contends that early diagnosis and early operation should save from 30 to 40 per cent of the cases. In the twelve cases at the Johns Hopkins Hospital the mortality was 59 per cent. There seems to be some relation between the time of perforation, the site of perforation, the patient's condition, and the prognosis. Very recently Drs. Harte and Ashhurst stated that the prognosis was most favorable in girls between 10 and 15 years of age, in which perforation occurred during the first week of the disease, when the constitution is still strong, or in convalescence when the frame is re-established, and where the operation has been performed within three hours after the symptoms of perforation; and where neither fecal extravasation had occurred nor adhesions were present. *It is certain that an early diagnosis and prompt, competent surgical intervention are of prime importance if ideal results are to be obtained.*

#### TREATMENT.

There is but *one*, and that is *surgical*. The prophetic words of Professor Wilson, "*The courage to operate will come of the knowledge that the only alternative is the patient's death,*" have at last come to be appreciated. Operation should be performed just

as soon as the diagnosis has been made. Dr. Carson<sup>73</sup> has recently stated that operation should not be performed if extreme shock be present. It is quite possible however that extreme shock will seldom be seen early after perforation. In only one of Manges' fifteen cases was collapse present. If shock be a prominent feature, I would advise atropine sulphate in place of the usual administration of strychnine. It is also important to remember that the patient should be moved about and palpated as little as possible. In some instances operation will be flatly refused. During a conversation with Dr. Steer, the latter said: "Just state in your paper that St. Louis is the worst place on earth to secure either an early operation or a post-mortem." Many of us can concur with Dr. Steer. Dr. Steer has seen several cases of perforation but in every instance operation was refused. When operation has been agreed to, the question of anesthesia becomes an important factor.

#### ANESTHETIC.

Dr. Cushing has strongly advocated local anesthesia for these cases. Drs. Shattuck, Warren and Cobb have very carefully investigated the subject and concluded that operation under cocaine anesthesia is not advisable in cases of mild typhoid where condition of mind and body is fairly good, because rationally the shock to the mental and physical organism from an abdominal operation, with all its attendant manipulations, to a conscious patient must be greater than the judicious use of ether. In moribund or stupid cases it may be of advantage. It must be admitted that experience with local anesthesia may be an important factor. Very recently my attention has been called to ether administered by the drop-method and in the cases in which I have employed it, the results have been perfectly satisfactory. To me it seems the ideal method of producing anesthesia and especially so, in these cases of typhoid perforation where struggling and straining are to be avoided, and

where a heart depressant is to be obviated. By placing five or six layers of plain gauze over a common chloroform mask, and administering ether by the drop-method you have the ideal results, and the danger is reduced to a minimum. I can not too strongly urge its adoption. In preparing the patient for operation he must be handled as little as possible and with *extreme* care and tenderness. The *abdomen should not be scrubbed with force* since the pain thus induced causes a contraction of the abdominal muscles and an outpouring of bowel content. The same applies to cases of gun-shot or stab wounds of the abdomen. Dr. Harrington<sup>74</sup> has very recently called attention to a solution prepared by himself, which is now being extensively employed. It is prepared as follows:—

Common Alcohol (94%) . . . . .	cc. 640
Hydrochloric Acid . . . . .	cc. 60
Bichloride of Mercury . . . . .	cc. .8
Aqua Distillata . . . . .	cc. 300

By simply and carefully washing the abdomen with warm soap-suds, then with turpentine followed by Harrington's solution, I believe that the results will be far superior to the more common methods. Even in shaving the abdomen pressure must be made very tenderly and slowly. It may be found valuable to place a roll of plain gauze, wrung out of Harrington's solution, on the abdomen for several minutes, then just before making the incision, wash off the abdomen with warm sterile water. To me, the technic of preparing the abdomen is very important.

#### OPERATION.

The operation should be performed as early and as quickly as is consistent with good surgery. Care and thoroughness are superior to hasty, half-done work. Have everything in readiness before making the incision. Each assistant must thoroughly understand what is expected of him. Operate systematically.

*Incision.* — The right lateral incision will be usually found the most serviceable since it fully exposes the cecum and lower ileum. In one of Dr. Brown's cases the incision was made on the left side because dullness, pain and extreme tenderness were found at that point. Make the incision free and through the outer portion of the rectus. First of all seek and find the cecum since it is a most valuable landmark. Then examine the appendix; if localized peritonitis be found, wall off the remaining parts with large pads of gauze; begin at the cecum and carefully examine the ileum from below upward; have two assistants watch with you for perforations; remember that the perforation may be covered with particles of lymph; it may appear as a black spot through which gas is escaping; carefully replace the examined bowel as you progress; if any portion of the bowel be left outside the abdomen it should be covered with pads wrung out of warm saline solution; don't have the patient surrounded by cold wet clothes; if feces have escaped into the peritoneal cavity the perforation will be medium sized or quite large; if only a slight amount of feculent material be present or if it be only lymph, it is very probable that there is a pin-point or pin-head size perforation; wherever lymph clings to the bowel it should be carefully wiped away; adhesions are to be carefully handled; they are not very favorable since it indicates plastic peritonitis and the presence of virulent streptococci; when the perforation has been found its treatment depends upon (1) its size; (2) the presence and character of escaped bowel content; (3) the condition of the surrounding tissues; (4) the condition of the patient. If the perforation be minute and there has been no escape of feculent material into the peritoneal cavity, and if the remaining parts look favorable, I would advise the closure of the perforation with a double row of Lembert silk sutures, and cigarette drains after having carefully wiped the parts with pads wrung out of warm saline solution, and just about the perforation I would wipe the parts with a pad wrung

out of peroxide of hydrogen, and then with the saline solution. If, however, there has been any escape of feculent material, and if the perforation be of medium size, and there are other suspicious points near the perforations, I would bring the loop up into the wound and surround the impending perforation areas with strips of gauze; a few sutures will hold the bowel in contact with the site of the incision and permit of free drainage; an artificial channel has thus been formed and by carefully flushing the area the best results are obtained, as pointed out by Escher,<sup>76</sup> who reported four cases so treated with a recovery of three. In those cases where feculent material has escaped into the free peritoneal cavity, the thorough flushing with normal saline solution will be found of great value. Escher's method is far superior to bowel resection; it saves time, affords free drainage, produces little or no shock, and there is far less danger of subsequent paralysis of the bowel and peritonitis. In the literature will be found cases in which resection was performed simply because Escher's method was unknown. Dr. Kyle and others have employed the method brought forward by Escher with better results than have been otherwise obtained in these severe cases. In a recent communication to me Dr. Nietert says: "The next case I get, if I find content of bowel in peritoneal cavity, and the patient in bad condition I will make an artificial anus, drain the pelvis and employ the Fowler's posture. The artificial anus will give perfect drainage to the part of bowel most affected, and therefore keep the ulcers clean and give them an opportunity to heal." Personally, I believe that free drainage should be employed in every case of bowel perforation. As before stated, it depends upon the several factors whether an artificial anus be made or not. If the case be seen early and operation be performed while the peritonitis is strictly localized, and no feculent material has escaped, closure of the perforation and free drainage

seems the ideal treatment: free drainage is of the greatest importance.

It is just here that I would impress upon the surgeon the necessity of placing drains in the pelvis and placing the patient in the extreme Fowler's posture in every instance where there has been free escape of bowel content or where peritonitis has developed. Drs. Mayo, Deaver, Murphy and others have found this method very valuable in the treatment of suppurative peritonitis.

Cases have been reported in which suspicious areas perforated subsequently and the gauze drains prevented any serious consequences. In flushing the abdominal cavity always flush the plevus first and thoroughly.

In closing I wish to emphasize the following points:—

1. Careful and complete bed-side notes should be kept in every typhoid case.
2. Any sudden change in the patient's condition should be immediately and thoroughly investigated.
3. Sudden severe abdominal pain demands immediate and careful consideration.
4. Morphine should *never be given a typhoid patient*.
5. Early diagnosis and early operation are prime requisites for the obtaining of ideal surgery.
6. Drainage should be employed in every case of typhoid perforation.
7. Call the surgeon early.

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## CLINICAL REPORTS.

## FOREIGN BODY IN EAR FIFTEEN YEARS.

BY A. F. KOETTER, M.D.

H. M., 36 years old, came to the clinic with the following history: About fifteen years ago while working in a grading camp he became involved in a quarrel during which he was shot in the right ear. He was unconscious for four days, but eventually recovered and had no trouble further than a purulent discharge from the ear, which continues to the present day. He had no treatment for the ear during all this time. Last spring he commenced to have attacks of dizziness, increasing in severity and this trouble brought him to the clinic. On examination a linear scar was visible on the crux helicis, further examination revealed a pledget of cotton packed tightly against the membrane, which according to his statement had been in the canal for a month or more, put in as he explains it to stop the discharge. The dizziness was somewhat relieved by removal of this cotton. A large perforation involving nearly the entire anterior half of the membrane was visible. In this perforation was seen a black mass which could be moved by the probe, the edges felt roughened as though it might be necrotic bone. The mass was lying obliquely in the cavity partially behind the posterior half of the membrane. The probe and curette could be passed over the foreign body but it could not be dislodged. It was finally removed with a dental hook or excavator. The foreign body proved to be a bullet weighing six grains  $\frac{1}{4}$ " long and  $\frac{1}{8}$ " thick. The handle of the malleus could not be seen through the perforation, but the inner side of

the bullet appeared covered with a substance that looked like bone. Dr. Warren was given scrapings and asked to test for insoluble phosphate. This was done in the following manner. First dissolve the scrapings in concentrated nitric acid, add to this solution about twice the quantity of ammonium molybdate  $\text{H}_2(4)_2\text{MoO}_4$ ). In the cold upon standing, or more quickly with heat, a yellow precipitate of ammonium phospho-molybdic acid appears when a phosphate is present. His report was affirmative and this led to the conclusion that the handle of the malleus was imbedded in the bullet. The dizziness entirely disappeared and the discharge ceased, after several treatments, by use of boracic acid.

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## PRIMARY TONSILLAR ULCERATION.

BY A. S. BLEYER, M.D.

Primary tonsillar ulceration is considered here as a disease essentially restricted to the involved gland or glands, as regards occurrence, course and cause. It is to be differentiated from the following tonsillar involvements, which may or may not be primary, but enter a distinctly different classification: syphilitic, primary, secondary and tertiary; tubercular, early and late; scrofulo-luetic; diphtheritic; typhoidal; scarlatinal, and all exanthematic tonsillar ulcerations; lupus, primary and secondary; cancerous and stomatitic.

The primary tonsillar ulcer, being excluded from the above, must then enter one of the following groups: Vincent's angina; acute lacunar ulcerative tonsillitis; gangrene of the tonsil; and, lastly, an indeterminate group of primary ulcers which do not bear the test laid down by Vincent.

Vincent described, in 1897, a primary ulcerative tonsillar disease that he had observed in his Paris clinics. The admirable work that he did on the subject is known by every one, and its great value lay in the isolation of a condition that was previously included in the class — tonsillar ulcerative stomatitis. Since Vincent's writings, this disease has not been heard much of, and it is in support of its existence that I make this report.

If we carry in mind the clinical picture of aphthous stomatitis, and then by examination find the ulceration to be limited to the tonsil — especially to one tonsil, we have very probably a case of Vincent's angina, and it remains but to find with the microscope the fusiform bacillus or the spirillum described by him as characteristic of the disease to make certain the diagnosis.

[The presence of these bacteria has since been amply verified, but search must be made in most instances before the end of the first 48 hours if it is to be successful.]

The case I wish to report is one in which the presumptive diagnosis assumed the following variations: diphtheria, pseudo-diphtherial angina, stomatitis and Vincent's angina.

Examinations of smears made daily during the first three days did not reveal either the diphtheria bacillus or Vincent's bacillus or spirillum. The diagnosis became narrowed to pseudo-diphtherial angina, and tonsillar stomatitis.

It would be uncommon indeed for the herpetic rash of the latter to limit itself to the tonsil — and herein lay the confusion in reaching a diagnosis, there being present three discreet ulcers on the left tonsil.

It is interesting to note that the condition present remained entirely obscure until the fifth day, when a raw, circumscribed area the size of a split pea was found in the ridge of the gum half inch from the anterior pillar of the affected side. It had come in the night, and was undoubtedly the later transformation of a vesicle, and settled the diagnosis.

On the sixth day, a like surface was found, although covered with a light, grayish membrane, on the cheek of the same side, opposite the teeth. Three days later, the case was well.

I therefore report a case of *herpetic stomatitis which was limited to the tonsil for five days*. Stress was laid upon the diagnosis — it is the important question in such cases, and *the existence of a tonsillar form of aphthous stomatitis is, then, a fact*.

Patient was child of thirty months.

In the Archives de Médecine des Enfants (No. 10, 1904) I note that Moizard and Frenet have demonstrated that Vincent's angina is identical with the condition described by Bergeron in 1851, and called by him, *ulcero-membranous stomatitis*. The disease does not therefore date from 1897.

## A CASE OF TETANUS — RECOVERY.\*

BY J. P. SIMPSON, M.D.

There is nothing new or startling to be announced in this paper; and the fact of the case having recovered, does not lead the writer to covet an undue number of a like sort. For they are rarely brought to us early enough for the accomplishment of what were in this case, probably the most potent measures for its recovery. The writer, while yet a student in college, once attended a meeting of The Southern Surgeons and Gynecologists; and there heard a Texas surgeon detail his experience with a case of tetanus, which recovered. The whole of his operative treatment may be summed up in one phrase—*aggressive antisepsis*. His logic was so clear, in the light of our present understanding of the pathology of this disease, as to be most convincing to any one, as it seemed to me. Accordingly, with the first opportunity which presented, his ideas were employed; supplemented, however, with the injection of anti-tetanic serum.

Following is an approximate history of the case: —

Elmer P., six years old, never had any serious illness; parents in good health.

On about July 20th, 1904, the patient received a slight wound on the plantar side of the left foot, while walking barefooted in the weeds. The wound suppurated a few days thereafter, and was picked open by the parents, with a needle; and after this it apparently healed and was forgotten.

At eleven o'clock in the night of July 30th, the father came to have me visit his son, who he stated was stiff in the back,

---

\* Read at a meeting of the Christian Co. Med. Soc., Oct. 20, 1904.

had a sore throat — he believed — and would awake from his slumber with a wild look upon his countenance. Inquiry developed the facts as before stated, regarding the wound in the foot; and the date of its occurrence fixed at July 20th, which, however, is only approximate. The father was at once informed that his son was suffering from lock-jaw; and was ordered to bring the boy to my operating room, without a moment's delay. This he accomplished, by wheeling the boy in a baby carriage, the boy being able to walk only with great difficulty, as was evident when requested to walk to the chair. The pronounced lordosis, and sardonic grin gave to the little patient a most grewsome aspect, never to be forgotten by my wife and me, the former having been aroused and requested to administer the anaesthetic.

*Surgical Treatment.* — The wound was opened by a free incision, a second incision was made across the first and at right angles to it, the resulting angles were turned up with tissue forceps and clipped off with shears, leaving a conical opening to admit of free irrigation. A gallon of hot mercuric iodide solution — strength one to four thousand — was allowed to play into the wound from an irrigator suspended about seven feet above the foot, after which the opening was cauterized with silver nitrate, dusted with iodoform and the usual dressing applied. The wound was dressed at intervals of forty-eight hours for a few days thereafter, although not in so elaborate a manner. At the second and subsequent dressings only a small amount of serum was found upon the gauze drainage, the pus cocci which were present before the wound was treated (as evidenced by the induration and redness) having evidently made an immediate and unconditional surrender, before such a vigorous onslaught.

*Medical Treatment.* — No medicine of any kind was given for the first eighteen hours, since it was desired to note the progress of the case, uninfluenced by nerve sedatives.

While yet in the operating chair, and before fully awake from the anesthetic, the jaws closed with an audible snap; the head was retracted, and the calf muscles became rigid for a few moments. The parents had not observed a convulsion previous to this time. The axillary temperature was at the time 99, and was never found higher than 102 or thereabout. Bromides and *Passiflora* were administered at irregular intervals to allay the irritability of the cord, the little patient's body having assumed a board-like stiffness on July 31st, and the convulsions were coming on at intervals varying from half hour to two hours or more. Fresh antitetanic serum had been ordered, meanwhile, and its administration was begun as soon as it arrived on August first. At this time the case was also seen by Dr. James Simpson, who proposed the use of chloral hydrate to supplement the action of the other sedatives. It was given in from six to twelve-grain doses, guarded with *digitalis*, every two hours as occasion demanded; and its influence was much more marked, upon the convulsions. Ten cc. of the serum were injected into the interscapular region, followed by two more doses of like size in the next twelve hours. The convulsions being much more easily controlled at this time, the serum was discontinued. It was observed that the convulsions affected the various sets of muscles irregularly: at one time there was marked *opisthotonos*, and again the *masseters* were most involved. The writer does not recall having seen this fact related in the literature. The tongue was frequently caught between the teeth and as a result became much lacerated. Indeed a piece of it was finally bitten off, giving that organ a crescentic contour at its tip. The convulsions gradually lessened in number and severity until they ceased altogether, about August 15th. It was observed that the shrill whistle of passing trains, some two blocks distant, had no effect toward bringing on a convulsion; they were, however, readily induced by little disturbances near him.



*Complications and Sequelae.*— On August ninth, ten days after the case had shown the first tetanic symptoms, and when the convulsions had become so light as to warrant a most hopeful prognosis, the patient had a severe rigor; and developed a temperature of 102, followed by sweating and a return to almost a normal temperature in ten hours. This phenomenon was repeated the next day at about the same hour; and it was deemed advisable to administer quinine, which was now given in two-grain doses every four hours, the family being advised again to begin the use of chloral if the irritability of the cord and the increase in the convulsions demanded it. Within twelve hours from the first dose of quinine the patient became much more restless, the convulsions again increased in frequency, although not alarming in severity. There was a slight rise of temperature on the next day, after which the temperature again dropped to normal; and the quinine was soon after that omitted. No blood examination was made; hence the foregoing is only offered for discussion. On August 22, several days after the patient had been dismissed, the writer was again called, to replace a prolapsed anus.

Bronchitis was present from the first, and lasted until about the third week in August.

Palmer, Illinois.

## THE ALUMNI ASSOCIATION.

The meeting held December 14, 1904, the first of the session, was held in the college building, second floor, 1806 Locust street, with Dr. A. R. Koetter in the chair. There was an attendance of sixty-six members, the largest in years.

The following men were proposed for membership: Drs. E. A. Babler, Albert May, H. E. Miller, J. M. Melvin, W. T. Coughlin, Wayne Smith, T. H. Albrecht, T. H. Nies, R. Fuhrmann, L. L. Yerkes, F. Fahlen, F. N. Gordon, L. H. Hempelmann, O. H. Elbrecht, S. T. Brownfield, A. C. Kimball. In accordance with the rules, action on their names was deferred until the next meeting.

A communication was read from the St. Louis Medical Society asking the co-operation of the Alumni Association in influencing action by the General Assembly of Missouri at its next session to secure the establishment of a State institution for the care and treatment of persons suffering with tuberculosis. The communication was signed by the Committee on Public Health and Legislation, Drs. G. Homan, F. L. Henderson, R. M. Funkhouser.

Dr. Homan in the discussion following thereon, dwelt on the far-reaching importance of the movement.

On motion of Dr. Fischel the society expressed its appreciation of the work already done and promised hearty co-operation in furthering the measures proposed.

The regular programme of the evening was then begun with a paper by Dr. W. E. Fischel.

### PRESENTATION OF A CASE: ACUTE HEMORRHAGIC PANCREATITIS (?) FOLLOWING GALL-STONE COLIC.

The case was that of a man in advanced middle age, weighing over 200 lbs., who had suffered from frequent attacks of gall-

stone colic, all with the exception of the first one being of a mild character. Between the attacks the patient always felt perfectly well and was able to attend to all the details of an active business career. On November 24 of this year the patient again had an attack of gall-stone pain. On this day the gall-bladder was not palpable. The following morning there was slight icterus, no nausea or vomiting. In the evening a resistance in the right upper abdomen, dense, sensitive. On November 26th a distinct mass could be outlined isolated from the liver, the size of a child's head, extending to  $1\frac{1}{2}$  inches left of the umbilicus. Temperature  $102^{\circ}$ , pulse 130. On Nov. 28, condition unchanged; consultation with Dr. G. Baumgarten; advise operation for "distended gall-bladder" (?). Temperature now fell to normal, pulse 80-94, no evidence of disturbance of pancreatic function.

On December 3rd Dr. Mudd operated, Dr. Tuholske as consultant. They found a large mass involving omentum, pancreas and surrounding structures whose exact nature could not be ascertained. No evidence of fat necroses. Several stones were removed from a *contracted* gall-bladder. Drainage.

The mass remained the same size after the operation. The temperature for nine days went up to  $104^{\circ}$  and over, pulse 130-140. Dressings saturated with bile at first; from the fifth day — Dec. 7 — onward also passage of fecal matter through the drainage tube. On several occasions material resembling curdled milk also came through the opening. Nutritive enemata were not retained. Hypodermoclysis resorted to. Finally on December 12 the patient succumbed.

The post-mortem performed by Dr. Walter Baumgarten showed the parietal peritoneum adherent to the edge of the drainage cavity. Elsewhere in the peritoneum no evidence of pus or inflammation. The pancreas showed numerous hemorrhagic areas. There was a large quantity of curd-like material in the drainage cavity. A perforation was found in the hepatic flexure.

In reviewing the history and findings of the case, Dr. Fischel

remarked upon the difficulties encountered in the diagnosis. Even the pathological findings did not wholly clear up the nature of the case. It is certainly curious that with such an involvement of the pancreas there should not have been evidence of functional impairment. The tests for trypsin and fatty acids showed this formation to be undisturbed. Furthermore there were no evidences of cachexia and anaemia as you would expect in acute suppurative pancreatitis.

In the discussion following, Dr. Hemplemann spoke of the association of gall stones with pancreatitis. The stone in these cases causes a back flow of bile into the pancreas with a resulting hemorrhagic inflammation of that organ.

Dr. Levy asked if there were any glycosuria at any time. Dr. Fischel: Repeated tests showed invariably the absence of sugar.

Dr. Myer agreed with the author as to diagnostic difficulties in these cases and inquired whether the colon had been inflated previous to operation. Dr. Fischel replied that this had not been done at the time on account of the evidences of a localized peritonitis.

Dr. Luedeking: What then was the diagnosis of the case according to the pathological findings?

Dr. Fischel: Even the post-mortem did not fully clear up the diagnosis but lent probability to that of acute hemorrhage pancreatitis.

Dr. Schlueter thought the case served to illustrate the importance of early operations in all cases of gall stones since complications of this kind might occur at any time.

In conclusion, Dr. Fischel expressed his opinion that the milky fluid found in the drainage cavity was due to the action of the pancreatic ferment on fat producing an acid reaction. He did not advise operation in all cases of gall stones, particularly where the attacks were as a rule of such a mild character and the general health so excellent.

Dr. R. Luedeking asked permission to present for demonstration a case of

**SITUS TRANSVERSUS IN A CHILD.**

The patient was in charge of Dr. O. H. Campbell at the Martha Parsons Hospital and at present showed nothing pathological outside of the anomaly referred to. Supplementary to the presentation, Dr. R. Terry read extracts from an article on The "Cause of Inverse Symmetry" by E. G. Conklin (Anat. Anzeiger, Oct. 5, 1908), in which the latter shows that the most probable cause of these cases of Situs Transversus is to be found before even the first cleavage stage of the ovum, and depends on a reversal of polarity.

Owing to the lateness of the hour, Dr. Grindon asked that the reading of his paper on the Seborrhoeic Process be postponed to another meeting.

Adjournment.

FRED J. TAUSSIG,  
Recording Secretary.

## NEWS AND PERSONAL MENTION.

The current number of the BULLETIN will introduce two additional departments; firstly, a department in which will be found a brief resumé of one or more original contributions that have appeared in the official publications of certain medical schools, or that have been produced in the laboratories of this country and Canada, devoted to research, along lines intimately connected with the science of medicine.

With these sources, exchange with the QUARTERLY BULLETIN of our Medical Department has been established, and the literature that will be received will be of the first grade appearing in this part of the world.

It is quite possible that this exchange list for the purpose of reviews of the most advanced and enlightened work, will be extended to the universities of other countries; if this becomes established, announcement will be made in due time of the fact.

A special space will be provided in our library for the publications received, for they will constitute a feature of the most important character. An invitation will be extended later on to those engaged in literary work to make free use of this collection.

Secondly, a department has been created for the reviewing of new books. It is not intended however to make lengthy criticisms or dissertations on comparative values, the object of the department being rather to draw the attention of our Alumni to what is new, and to make such comments as we believe will be of guiding use to them.

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The library of the Medical Department has been the recipient of several donations since our last issue: —

Dr. Harvey G. Mudd gave a set of Reference Handbooks of the Medical Sciences, vols. I. to VII. inclusive.

From Dr. Carl Brockhausen, '71, the library received the following volumes: —

Thos. Sydenham, *Opera Universa*, 1 vol., 1705.

Boerhave, *Opera*, 3 vols., 1751.

Benj. Bell, *System of Surgery*, 7 vols., 1706.

v. Langenbeck, *Nosologie und Therapie der Chirurgischen Krankheiten*, 5 vols., 1840.

Wunderlich, *Pathologie und Therapie*, 6 vols., 1840.

A complete file, bound, of the *Wiener medizinische Wochenschrift*, 1854 to 1890.

The *Index Medicus* for 1904 is the gift of the Carnegie Institution of Washington, D. C.

Dr. Albert E. Taussig has contributed some fifteen volumes among which are the *International Clinics* for the past three years and six volumes of *Maly's Jahresbericht*.

From the funds of the Co-operative Association the library has recently acquired a complete set of the *Journal of Comparative Neurology*.

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The revised roster of the Medical Department shows the presence this semester of 246 students. Of these 58 are freshmen, 54 sophomores, 54 juniors and 64 seniors. There are, beside, 16 post-graduate students, most of whom came to us from other schools.

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Dr. George Gellhorn has recently been added to the teaching staff of the school as instructor of gynecologic pathology.

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In the article "Class-work in Practical Anatomy" in the last issue of the *BULLETIN*, credit for advocating clay modeling in

teaching osteology should have been given to Dr. Moody of the Anatomical Department, University of California.

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The editors have received from several medical libraries requests for complete files of the BULLETIN. To our great regret we are unable to comply with these requests as our supply of numbers 1, 2 and 3 of Volume II has been exhausted. Alumni who have these numbers and are willing to part with them would do the school a service by forwarding them to Dr. Albert E. Tausig, Medical Department Washington University, 1806 Locust Street, St. Louis.



## REVIEW OF CERTAIN NEW WORK FROM THE UNIVERSITIES AND THE LABO- RATORIES.

Volume I. for 1904 of Studies from the Department of Neurology, of the Cornell University Medical College, contains much that is new and most interesting.

It would be a privilege to enter here, ample abstracts of these contributions, but propriety in the use for our own good of the work of other schools requires that our selection be sharply limited.

In an interesting article the question as to the existence of a "naming center" is discussed. The contribution contains the history of a case of sensory anomia, clinical and pathological, in which the authors found the following pathologic lesions and conclude with the argument set forth below.

We regard the statements made by Chas. L. Dana and Jos. Fraenkel in this article, as final on this subject:—

The indefinite character of aphasia pathologically has brought forward many hypotheses and theories that have unfortunately served rather to confuse than enlighten the physiologists, their teachings have therefore been somewhat vague and inconsequent, and it has been simply from the clinician and the pathologist that any conclusive evidence has been given.

In this case of sensory aphasia—with loss of memory for names,—the cerebral lesions, demonstrated by J. R. Hunt, were as follows: Three patches of softening on the internal surface of left cerebral hemisphere. The largest one involved the posterior third of first temporal convolution superficially and extended into the lip of Sylvian fissure. A second point of superficial soften-

ing lay a little anteriorly to the middle third of second frontal convolution. The third—also superficial—and smallest patch, was found on the inferior surface of first frontal. Sections showed the more extensive softening of the cortical layers to run into the lip of Sylvian fissure. The parts below the gray matter contained connective tissue. The brain and medulla showed no sign of central lesion, old or new.

The findings then were simply a result of an obliterating endarteritis, involving the cortex and some of the white matter.

Argument:—

Since articulate speech learns its fixed lesson through the auditory center, from the fact that speech is a product of repeatedly using the same name for things heard (by their given names), such a name having been used when the given object was seen or felt or heard or smelled, it is therefore evident that the auditory center is the center which is first cultivated in the mechanism of speech. The importance of this fact lies in the determination of the direction in which the association impulses flow, in the production of articulate speech. The articulatory center receives, therefore, its impulses from the auditory center.

In elucidating the rôle of the association tracts concerned in speech with nouns, we find that two-thirds of the names we use are abstract names, names of things neither seen, felt or smelled, such for example as "symptom" or "justice." In such cases impulses converge to the auditory center from widely distributed association tracts, e. g., those concerned in memory or emotion. They are then sent to the articulatory center.

Bearing this carefully in mind, we are then in a position to understand that in a deaf and dumb individual, the same centers, i. e., the auditory and articulatory centers would be replaced by impulses originating in the visual centers and traveling perhaps to the tactile areas and thence to the gesture centers.

Plainly, this requires a very different mechanism than in the normal person.

In order to impress this point, an example will be mentioned. In the case of a normal person, the sight or odor of an orange would arouse firstly the visual or gustatory centers, the impulse would then pass to the auditory center and from there to the articulatory center. Now — in the case of a deaf-mute, the sight or odor of an orange having aroused the visual centers or the gustatory centers, would then be transmitted to the Rolandic area (gesture centers) and thence perhaps to the center for the expression of the deaf and dumb alphabet.

It is apparent then that for an identical mental end, in the normal and abnormal subject, a special and different mental process is put into action; different centers are awakened, and with absolutely the same end, namely, the reproduction of a learned name excited by the perception of a learned object.

The above has been insisted on rather strongly, because it is the key-note of the article. It settles to our minds, for all times, the question of a naming center and is productive of this conclusion: —

*There is no special center for naming.*

In sensory aphasia, it is seen therefore that we have not so much an injury of a naming center, as an injury of the association mechanism serving to connect the areas associated with the visual and auditory centers, or in the case of the deaf and dumb, the visual and gesture centers, etc., etc.

Total sensory anomia (aphasia) would exist when the patient had lost the ability to name things seen, felt, heard or smelled; and divisions such as optic anomia or gustatory anomia or tactile anomia are permissible when the disease is limited to any one of these centers alone. This is extremely rare, although a combination of optic with tactile anomia is a more frequent state of affairs.

A subcortical aphasia would exist when we have found that the

patient retains the name of the object seen or felt or smelled, but cannot say it under stimulus through these channels, but who can repeat the name when it is spoken to him, showing that the name has been retained. Again, although the name cannot be elicited by sight, smell or touch, it may be elicited by excitation of the articulatory center by impulses flowing from the association areas, in the process of thought or feeling — this also is subcortical aphasia.

Dr. Dana, however, cautions us that these terms may be misleading, as for example, in the case that we are reviewing, where a total sensory subcortical aphasia existed, there was still some of the cortical tissue destroyed. Hence these anomias may be subcortical, or they may be partially cortical.

Conclusions: —

(a) There is no special center for naming. An important center for the naming of concrete things lies in the first and second temporal convolution, this is a center for sensory anomia.

(b) Sensory anomia is a form of aphasia characterized by inability to name things seen, and often things heard, felt, tasted or smelled. Its especial character can be indicated in particular cases, by the terms optic, optic and tactile, etc.

(c) The use of anatomical terms such as cortical and subcortical to indicate psychological processes is not a very practicable or rational procedure; and it would be better to drop the words cortical and subcortical in describing aphasias. In the present case there was what would be called a subcortical aphasia with a lesion mainly cortical.

## BOOK NOTICES.

**The Principles and Practice of Gynecology** — for students and practitioners, by *E. C. Dudley*, A. M., M.D. Fourth Edition, revised. With 419 illustrations in colors and monochrome, of which eighteen are full-page plates. Lea Brothers and Co., Philadelphia and New York.

We have here a book of the first order — it is not surprising, coming from the president of the American Gynecological Society.

The arrangement of sections is new, and will require the test of the class room, before we can say much about it. The trend of the discussion is not divided into chapters created to harmonize roughly with the anatomical proximity of organs, or their sequence physiologically. It is divided rather in recognition of what of sequence can be found from the view-point of etiology and pathology. This departure from the older classifications signals most forcibly the modern conception of the basis of gynecologic surgery.

Seventeen pages are devoted with great care to "Aseptic Technique" in Chapter II. In Chapter III. the methods of cystoscopy are dealt with in connection with diagnosis. The descriptions are amply illustrated. It is apparent here that there has been a careful sifting of the literature, for most of what is important for the student or general practitioner is recorded. Ten pages in Chapter VII. are devoted to drainage in major operations. Chapter IX. deals with the relation of dress to the diseases of women.

The second section of the book comprises a broad consideration of infections, inflammations and allied disorders. Parts three, four, five and six, are devoted respectively to (a) Tumors,

Tubal Pregnancy and Malformations. (b) Traumatisms. (c) Displacements. (d) Disorders of Menstruation.

The work is conservative, ample and very thorough, and the new arrangement of subjects appears to us a most worthy one.

**A Treatise on Obstetrics** for students and practitioners, by *Edward P. Davis, A.M., M.D.*, Professor of Obstetrics in the Jefferson Medical College. Second edition. Illustrated with 274 engravings and 30 plates in colors and monochrome. Lea Brothers & Co., Phila. and New York.

Many most excellent plates that we have never seen before, appear in this work — including a radiograph illustrating the practical value of photography in obstetric diagnosis.

Thirty-five pages are devoted to the pathology of the embryo and foetus, including a remarkably extended list of subjects. A lengthy and meritorious dissertation is found on Hydramnios and Polyhydramnios. This deserves mention simply on the ground that for some reason quite obscure to us the subject of Polyhydramnios is usually slighted in text-books on obstetrics. It is of far greater importance than the student of many of our best text-books is apt to imagine. Foetal death also receives more extended consideration than is usually given it.

We are surprised at the definiteness of statements made about the effects of diet on the foetus, — directions are given as to the manner of limiting the development of the foetus to correspond with a contracted pelvis — this is extremely advanced. Quite properly, the method is “deserving of attention” as stated, and is perhaps “the result of the most thorough investigation which has yet occurred on the subject,” but perhaps also, the student or even the medical practitioner would be too strongly impressed with its certainty and efficacy.

Pelvimetry and pelvic deformities receive careful attention.

We find a guarded approval of the value of Bossi's dilators.

The surgery of pregnancy receives merited attention, and much space is devoted to the physiology and pathology of the newborn.

The book ends with a much needed section on the jurisprudence of obstetrics, divided into five chapters: Abortion, Legitimacy of Birth, Infanticide, The Determination of Pregnancy and Previous Child-birth and The Legal Aspects of Obstetric Practice.

This work in many ways is the complement of all that has gone before it, with most of the usual statements reiterated. Certain deficiencies in other books as pointed out above do not exist here. The material is ably and impressively handled.

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## CONTENTS.

	Page.
Calendar . . . . .	175
Corporation and Board of Overseers . . . . .	177
Faculty, Instructors and Assistants . . . . .	179
Officers and Committees . . . . .	186
General Information . . . . .	188
Staffs of Hospitals and Clinics . . . . .	195
Historical Sketch . . . . .	196
School Buildings and Equipment . . . . .	197
Library and Publication . . . . .	204
Requirements for Admission . . . . .	206
Plan of Instruction . . . . .	213
Details of the Plan of Instruction . . . . .	214
Promotion . . . . .	236
Requirements for Graduation . . . . .	237
Prizes, Scholarships and Assistantships . . . . .	238
Co-operative Association . . . . .	238
Young Men's Christian Association . . . . .	239
Fees and Expenses . . . . .	240
Names of Students in Attendance . . . . .	245
Post-Graduate Students and Other Matriculants . . . . .	252
Graduates of 1904 . . . . .	254
Hospital Appointments for 1904 . . . . .	256
Prizes and Honors for 1904 . . . . .	258
Graduates of 1905 . . . . .	259
Hospital Appointments for 1905 . . . . .	260
Prizes and Honors for 1905 . . . . .	261
Rules for the Guidance of Students . . . . .	262
 Clinical Reports:	
An Unusually Early Case of Cancer of the Cervix Uteri. By Dr. Fred. J. Taussig . . . . .	264
Mycotic Vaginitis During Pregnancy. By Dr. Fred. J. Taussig	266

## CALENDAR.

### JANUARY, 1905

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

### APRIL, 1905

3	4	5	6	7	8	
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

### JULY, 1905

2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

### OCTOBER, 1905

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

### FEBRUARY, 1905

5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

### MAY, 1905

7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

### AUGUST, 1905

6	7	8	9	10	11	12
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27	28	29	30	31		

### NOVEMBER, 1905

5	6	7	8	9	10	11
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### MARCH, 1905

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### JUNE, 1905

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### SEPTEMBER, 1905

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### DECEMBER, 1905

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### JANUARY, 1906

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### APRIL, 1906

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### JULY, 1906

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### OCTOBER, 1906

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### FEBRUARY, 1906

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### MAY, 1906

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### AUGUST, 1906

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### NOVEMBER, 1906

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### MARCH, 1906

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### JUNE, 1906

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### SEPTEMBER, 1906

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### DECEMBER, 1906

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16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

On the dates in heavy type, the regular exercises of the School will be suspended for holidays, for examinations and for commencement.

## CALENDAR.

1905.

**ENTRANCE EXAMINATION**, conducted by an examiner appointed by the Chancellor of Washington University, will be held Friday, September 29, and Saturday, September 30, at 1806 Locust Street.

**ACADEMIC YEAR** will begin Monday, October 2.

**EXAMINATIONS** will be held Saturday, October 7, for removal of conditions in special subjects.

**HOLIDAY**, Thursday, November 23, Thanksgiving Day.

**CHRISTMAS RECESS** will begin Thursday, December 21, and end Wednesday, January 3, 1906.

1906.

**MID-YEAR EXAMINATIONS** will begin Monday, January 22, and end Saturday, January 27. During this week all other work will be suspended.

**SECOND HALF-YEAR** will begin Monday, January 29.

**HOLIDAY**, Thursday, February 22, Washington's Birthday.

**EXAMINATIONS** will be held from Monday, May 14, to Saturday, May 19, as follows; (a) in special subjects; (b) for removal of conditions; (c) for admission to the third year class and for graduation. During this week all other work will be suspended.

**COMMENCEMENT** will be held Thursday, May 24, 1906.



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Professor W. C. GLASGOW . . . . . Medicine.  
Professor N. B. CARSON . . . . . Surgery.  
Professor H. G. MUDD . . . . . Surgery.  
Clinical Professor ELSWORTH SMITH . . . . . Medicine.  
GIVEN CAMPBELL, M.D. . . . . Neurology.

ST. LOUIS INSANE ASYLUM.

Professor F. R. FRY . . . . . Mental Diseases.  
M. A. BLISS, M.D. . . . . Mental Diseases.

## GENERAL INFORMATION.

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On arriving in Saint Louis at the Union Station, students are within five minutes walk of the main building of the Medical Department, 1806 Locust Street. The offices of the School are in the building, and students are requested to come here for all information.

It would be to the advantage of students if they would register a few days in advance of the opening exercises and secure boarding-places, so that their studies may not be interrupted in the beginning.

Students may register and pay all fees at the office of the Dean which will open daily throughout the year from 11 A. M. until 1 P. M. *Positively no students will be admitted for the session of 1905-1906 later than October 14; but students may matriculate for the session of 1906-1907 at any time before or after this date.*

The officers of the School, or Y. M. C. A. of this department, will give students information as to rooms, boarding, etc. Board and lodging at a convenient distance from the School may be obtained at from sixteen to twenty dollars a month. In this connection attention is called to the new Washington University Dormitory and Commons in which Students of the Medical Department may lodge and board.

Physicians, or alumni, who may wish to receive regularly the Quarterly Bulletin are requested to make written application to the Dean of the Faculty. Notice of change of residence is desired. All further information may be obtained by addressing:

DEAN OF THE MEDICAL DEPARTMENT,

WASHINGTON UNIVERSITY,

1806 Locust Street,

St. Louis, Mo.



## BRIEF HISTORICAL SKETCH.

Early in the year 1899 the respective Faculties of the Saint Louis Medical College and of the Missouri Medical College, took certain preliminary steps toward the union of these two institutions. With this end in view both Faculties resigned, and in due course combined to form the Medical Department of Washington University.

The Missouri Medical College was founded in 1840, and with the exception of the years of the Civil War had given continuous instruction up to the end of the session of 1898-1899.

The Saint Louis Medical College was founded in 1842, and had just completed its fifty-seventh consecutive annual course. Under an ordinance enacted in 1891, it had been created the Medical Department of the Washington University. It had continued in that relation until the close of the session of 1898-1899, when it united with the Missouri Medical College, the two schools becoming, as previously stated, the Medical Department of Washington University. This union was undertaken and successfully consummated solely in behalf of a broader and more thorough training and we firmly believe that this object has been accomplished.

Thus, the Medical Department of Washington University, as constituted at the present time, will begin its seventh annual session October 2, 1905. The prestige of a university connection and the educational, social and athletic privileges accompanying it are of great benefit to the student. Representing, as it does, the two oldest medical colleges in the West, and having assumed their alumni and all their honored traditions, its graduates may be found in every State and its influence is widespread. A school, having at its disposal the combined resources of two institutions of such high standing, has much to offer students of medicine. Its teaching force, of professors, lecturers, and clinicians, numbers more than one hundred.

## COLLEGE BUILDINGS, LABORATORIES, AND CLINICAL FACILITIES.

The Medical Department owns and occupies two buildings, the one a hospital, the other a laboratory building, in which are conducted the teaching work of the School; there is in each a large free dispensary. It also has absolute control of the clinical privileges of two large hospitals within easy access of the school buildings. In the several city institutions it has equal privileges with others in regard to clinical instruction.

### LOCUST STREET BUILDING.

In this building, which is situated on Locust Street, between Eighteenth and Nineteenth Streets, are most of the laboratories and the O'Fallon Dispensary. It was formerly occupied by the St. Louis Medical College, and was erected in 1892, after a careful comparison of the buildings of the leading eastern medical schools had been made. It is a spacious and elegant structure and thoroughly modern in all its equipments.

The building has been designed to facilitate the combination of didactic instruction with laboratory work, by the provision of lecture halls and class rooms.

A number of research rooms have been equipped for advanced work in the departments of Medicine, Pathology and Bacteriology, Chemistry and Ophthalmology.

In addition to the space occupied by the offices of the dean, secretary and registrar, this building contains six lecture-rooms; two large laboratories for elementary, organic and physiological chemistry; practical anatomy rooms for dissection and for the preparation of material; an osteological laboratory; large museum of normal anatomical specimens; a laboratory for histology, embryology and organology; a very full working museum of

## 198 WASHINGTON UNIVERSITY MEDICAL DEPARTMENT.

pathological anatomy; pathological and bacteriological laboratory; and a fully organized clinical department. The various laboratory departments are equipped with the latest instruments of precision and with apparatus adapted both for demonstrations and for original research.

### WASHINGTON UNIVERSITY HOSPITAL.

During the summer of 1904 it was decided to remodel and convert the beautiful and spacious building erected in 1895 on the west side of Jefferson Avenue, between Washington and Lucas Avenues, which was formerly occupied by the Missouri Medical College, into a modern hospital with 135 beds for the reception of patients for teaching purposes. This hospital was opened January 1st, 1905, and is now complete and thoroughly equipped in every detail, at a cost of \$50,000.00. It is a four story building extending back 135 feet with frontage of 90 feet on Jefferson Avenue. It is designed in French Renaissance and Greek detail, and is constructed in gray sandstone and yellow brick. The main entrance is on Jefferson Avenue.

The basement contains furnace rooms, rooms for stores, laundry, kitchen and dining-room.

On the first floor are the Faculty room of the Medical Department, one lecture room and ten clinic rooms and laboratories. All these rooms are constructed for teaching sections of classes.

The second floor is divided into fourteen rooms. These are two maternity wards, examination room, delivery room and physician's room, two public wards for men and women, one male and one female colored ward, and five private wards.

The third floor is occupied by four wards: one large ward for women, one large ward for men, two wards for children and five private wards.

The fourth floor contains a large and beautiful operating room, anaesthetist's room, sterilizing room, aseptic laboratory, locker

room and dressing room, surgical laboratory, two surgical wards and three private wards.

Each floor has a model diet kitchen with elevator connections with the basement kitchen, clothes-chute and telephone system. The building is well lighted and ventilated and all floors are thoroughly equipped for the best care of patients. Thus the facilities for clinical study by students in this Department are those usual in the best teaching hospitals in this country. Students have access to all cases occupying beds in this new institution.

#### WASHINGTON UNIVERSITY HOSPITAL DISPENSARY.

This department, formerly the Polyclinic Dispensary, with a new addition recently built, has long been the seat of thorough clinical work and has become of special importance in this respect, from its position immediately next to, and in connection with, the new Washington University Hospital. This hospital connection with a large clinic department enables the student to observe the course and treatment of disease throughout its various stages.

The Dispensary contains one large operating room which offers unrivaled facilities for instruction in Operative Surgery.

Recently a number of research laboratories have been established in the Dispensary in connection with the departments of Medicine, Surgery, Dermatology, Ophthalmology and Gynecology. A large X-ray machine has also been installed.

During the year 1904, 8,732 patients were treated, making 45,768 visits to the various clinics.

The following clinics are held daily throughout the year: —

- 9 A. M. . . . . Diseases of Women.
- 10 A. M. . . . . Diseases of the Nervous System.
- 10 A. M. . . . . General Medicine.
- 11 A. M. . . . . Diseases of Children.
- 1 P. M. . . . . Diseases of the Ear.

## 200 WASHINGTON UNIVERSITY MEDICAL DEPARTMENT.

- 2 P. M. . . . . Diseases of the Throat.
- 2 P. M. . . . . Diseases of the Chest.
- 2 P. M. . . . . Diseases of the Eye.
- 2 P. M. . . . . Surgery and Diseases of the Genito-Urinary  
Organs.
- 2 P. M. . . . . Diseases of the Skin.
- 3 P. M. . . . . Deformities and Joint Diseases.

### O'FALLON DISPENSARY.

The entire first floor of the Locust Street Building is used by this large free dispensary for its patients. It is a fully equipped dispensary for the sick poor. It also affords ample material for extended practical clinical instruction in the various departments of Medicine and Surgery.

The building is so arranged that each department has a room for practical instruction to students in small sections, in addition to the rooms devoted to the treatment of patients; besides there is a large theatre for clinical lectures.

All modern appliances for the treatment of diseases have been introduced, so that students can learn thoroughly the use of all methods in each of the special departments of medicine.

During the year 1904, 4,883 patients were treated, making 38,569 visits to the clinic.

The following clinics are held daily throughout the year: —

- 10 A. M. . . . . Diseases of the Nervous System.
- 11 A. M. . . . . General Surgery.
- 11 A. M. . . . . Diseases of Women.
- 11 A. M. . . . . General Medicine.
- 11 A. M. . . . . Diseases of the Skin.
- 2 P. M. . . . . Diseases of the Ear.
- 2 P. M. . . . . Diseases of the Nose and Throat.
- 2 P. M. . . . . Deformities and Joint Diseases.
- 2:30 P. M. . . . . General Surgery.
- 3 P. M. . . . . Diseases of the Rectum.
- 3 P. M. . . . . Diseases of the Eye.

8 P. M. . . . .	Genito-Urinary Diseases of Women, Tuesday, Thursday, Saturday.
8 P. M. . . . .	Diseases of Children.
8 P. M. . . . .	General Medicine.
8:30 P. M. . . . .	General Medicine for Women.
4:30 P. M. . . . .	Genito-Urinary Diseases for Men.

The Obstetrical Out-Clinic is one of the most valuable clinics attached to this dispensary. The resident physician in charge of the clinic is chosen at the end of each school year by the professor of obstetrics from the graduating class. Under his guidance senior students are afforded special opportunities for practical work in this important branch of medicine. During the senior year each student is required to be in actual attendance upon five or six cases.

#### ST. LOUIS MULLANPHY HOSPITAL.

This is the oldest and most widely-known hospital in the West, founded in 1828, and conducted under the charge of the Sisters of Charity.

In the hospital proper, approximately one hundred patients are admitted each month for treatment, and in the out-patient department about twenty-five hundred annually.

The last annual report shows a total of seven hundred and fifty-five operations performed in the hospital, to most of which students of this School are admitted.

A large number of the general clinics and about one-half of the bedside teaching to the fourth-year class is given in the wards of this Hospital.

The members of the Faculty, who are attending physicians and surgeons to the Hospital, hold regular clinics, and small sections of the classes are taken into the wards, where the students are required to examine patients suffering from various medical and surgical diseases. Students of the fourth-year class are regularly assigned to the care of cases in the wards under the supervision

## **202 WASHINGTON UNIVERSITY MEDICAL DEPARTMENT.**

of the attending and house staffs. The Hospital itself is one of the largest in this city, and has always been distinguished for the abundance of its clinical material.

### **BETHESDA HOSPITAL.**

Bethesda Hospital, with its foundlings' and maternity departments, is under the immediate charge of Professor E. W. Saunders. The Foundlings' Home, 3651 Vista Avenue, is within twenty-five minutes ride of the Medical Department, and is easily accessible from all parts of the city.

This modern institution cares for over one hundred infants and children, and affords exceptional advantages for the study of diseases in infants and young children.

The Maternity Department, 1210 Grattan street, is open to senior students of this School only, affording opportunity for obstetrical diagnoses and experience.

### **CITY HOSPITAL.**

The buildings of the City Hospital occupy the block bounded by Pine, Chestnut, Seventeenth and Eighteenth Streets. They are within three minutes walk of the Medical Department.

At this institution about fifteen thousand patients are treated annually. The wards, accommodating on an average six hundred patients, offer a wide range in the selection of cases for presentation before the classes. An amphitheater, with a well-lighted arena equipped for surgical operations, is provided for teaching purposes. Clinical instruction, supplemented by the use of the microscope, is given here. The Senior Class is obliged to attend the weekly clinics in Medicine, Surgery and Diseases of the Nervous System.

### **INSANE ASYLUM.**

The buildings of the Insane Asylum are located in commodious

grounds on Arsenal Street, opposite Macklind Avenue, about thirty minutes ride from the Medical Department.

The Insane Asylum accommodates about seven hundred inmates. Attendance weekly is required for senior students.

#### MATERNITY DEPARTMENT OF THE WASHINGTON UNIVERSITY HOSPITAL.

The Maternity Department is situated on the first floor of the Washington University Hospital. It is in full running order and is completely equipped for obstetrical teaching. The service is under the exclusive direction of the Professor of Obstetrics in the Faculty of the Medical Department of Washington University.

The Operating Room is equipped with all modern surgical and obstetrical conveniences. The number of patients in attendance is steadily increasing, so that now, each senior student attends at least seven cases.

These with obstetric operations and subsequent treatment of women and infants, afford invaluable practical experience, such as is offered at no other medical school in the West.

#### PRIVILEGES.

As the Medical Department is an integral part of Washington University, its students may enjoy all the privileges and facilities open to members of any Department of the University. Students may reside in the University Dormitories and are eligible to various social and other organizations of the student body.

The Department Library maintains a small but well-selected reference library of about 5,000 medical books and journals at the Locust Street Building, and the facilities of the St. Louis Public Library are open to all students of medicine. In the Department Library there is a very complete file of scientific journals, both foreign and American, and a full collection of works in the branches most closely related to Medicine.



## 204 WASHINGTON UNIVERSITY MEDICAL DEPARTMENT.

The University Gymnasium is situated at the west end of the campus and is open to medical students who may enjoy the privileges. The Gymnasium is large and thoroughly equipped and is under the charge of the Physical Director.

Besides the work of the regular curriculum, the University offers many courses of Public Lectures. Lectures of general scientific interest are given from time to time both at the University and at the Locust Street Building, throughout the academic year.

### LIBRARY.

The library, at present numbering four thousand seven hundred volumes, has been classified and carefully catalogued, and is now being made use of by students, instructors and others connected with the School. Out of the proceeds of the Co-operative Association and from gifts about two hundred books were added last year and eight new journals subscribed for. Of the books purchased a large number are standard text-books and atlases for the use of students. During the present school year all of the journals requiring it were bound so that now with the catalogue the library is accessible to readers and consultants.

Exclusive of medical journals, 33 scientific periodicals are received, distributed as follows:—

Chemistry . . . . .	5
Anatomy . . . . .	9
Physiology . . . . .	9
Pathology and Bacteriology . . . . .	7
Pharmacy . . . . .	1
Pharmacology . . . . .	1
Medicine . . . . .	1

### PUBLICATION.

The Quarterly Bulletin of the Medical Department of Washington University publishes accounts of the work of the several

departments, the progress and results of original research in this School and others, book notices, and personal news of interest concerning the alumni and others connected with the institution.

It is the official organ of the Alumni Association and for the past two years has been mailed free to the graduates of the original schools and of the present one.

The third volume is completed with this issue.

## REQUIREMENTS FOR ADMISSION.

Candidates for admission to the Medical Department will be received upon the following conditions:—

1. A satisfactory certificate of good moral standing.

2. *Admission by Diploma.* Any candidate who has received a degree in Arts or Science from a College or University recognized by this department, will be admitted without examination.

Diplomas of Public High Schools, Academies, with a four years' course, also of State Normal Schools having a course equivalent to a four years' High School course, are accepted as complete certificates. Diplomas must be presented by candidates to the Registrar on the date of matriculation.

Any candidate who shall present written evidence of having passed the entrance examinations of a recognized College or University, in which the requirements are equivalent to those demanded for entrance to this Department, will be admitted without examination.

3. *Admission by Examination.* Candidates for admission to the first year class of the Medical Department, who do not possess the foregoing qualifications, will be required to pass examinations in the following subjects:—

English, A and B.

Mathematics, A and B.

Latin, A and B.

History, A and B.

In addition to these subjects, the candidate must present himself for examination in five subjects, which he may choose from the following:—

English, C.

Mathematics, C.

Mathematics, D.

Mathematics, E.

Latin, C.

Latin, D.

Greek, A.  
 Greek, B.  
 Greek, C.  
 German, A and B.  
 French, A and B.  
 Physics.  
 Chemistry.  
 Botany and Zoology.

ENGLISH.

No candidate will be accepted in English whose work is notably defective in spelling and punctuation.

A. (1) Grammar.

(2) Composition. — A short essay, correct in spelling, punctuation, grammar and division of paragraphs, written on a subject to be announced at the time of the examination.

B. The candidate must present evidence of a general knowledge of the following works and their authors: Shakespeare's *Merchant of Venice*; Pope's *Homer's Iliad* (four books); Goldsmith's *Vicar of Wakefield*; Coleridge's *The Rime of the Ancient Mariner*; Tennyson's *The Princess*; Scott's *Ivanhoe*; Lowell's *The Vision of Sir Launfal*; Cooper's *The Last of the Mohicans*.

C. The candidate must present evidence of a special knowledge, form and structure of the following works: Shakespeare's *Macbeth*; Milton's *Lycidas*, *Comus*, *L'Allegro* and *Il Penseroso*; Burke's *Speech on Conciliation with America*; Macaulay's *Essays on Milton and Addison*.

MATHEMATICS.

A. *Algebra*, including reduction of fractions, solution of simple equations with one, and with two or more unknowns, the Theory of Exponents, the Theory of Radicals and Proportion.

B. *Geometry, Plane*, with exercises (as in Wells, Wentworth or Phillips and Fisher).

208 WASHINGTON UNIVERSSTY MEDICAL DEPARTMENT.

- C. *Geometry, Solid*, with numerical exercises (as above).
- D. *Trigonometry, Plane*. (Wells, Wentworth, Phillips and Strong.)
- E. *Algebra, advanced*, beginning with Quadratic Equations through the college text. (Wells or Wentworth.)

LATIN.

- A. *Grammar*. (1) Inflection and derivation of words. Syntax, with writing simple Latin prose.
- B. *Cæsar*:  
Latin prose translation will be based on Cæsar's Gallic Wars. Books I., II., III., IV.
- C. *Cicero*:  
Translation at sight of passages taken at large from Cicero's speeches.
- D. *Virgil*. Ovid's *Metamorphosis* or from prose and verse of no greater difficulty.

GREEK.

- A. *Grammar*. Xenophon's *Anabasis*, Books I. and II., will be the basis of this examination, which will consist of the common forms and construction, and simple sentences turned into Greek or English.
- B. *Homer*. *Iliad*, Books I. and II. with questions on forms and construction.
- C. *Herodotus*. Questions on forms and construction.

HISTORY.

- A. (1) United States History. Fiske or equivalent.  
(2) Civics; origin and development of our institutions.
- B. English History; or  
Greek History and Roman History.

GERMAN.

- A. *Grammar.* The declension of nouns, articles, adjectives, pronouns; conjugation of strong and weak verbs. The test will consist in part by direct grammatical questions, and in part of translation of simple English into German.
- B. *Literature.* Translation at sight of easy German Prose selected from three representative nineteenth century writers.

FRENCH.

- A. *Grammar.* The conjugation of regular verbs and of the more frequently occurring irregular verbs; forms and positions of the various pronouns and adjectives, inflections of nouns and adjectives. This will be tested by the translation into French of a short connected passage.
- B. *Literature.* Sight translation, and ability to render into good English a passage of nineteenth century prose.

PHYSICS.

The test involves a consideration of the elementary principles of Mechanics, Sound, Light, Heat, Electricity and Magnetism, as presented in the text of Carhart, Chute, Avery or Gage.

CHEMISTRY.

A knowledge of Remsen's Elements of Chemistry or its equivalent is required.

BOTANY AND ZOOLOGY.

Botany; the equivalent of the work of one year in the St. Louis High Schools.

Zoology; the equivalent of the work of one year in the St. Louis High Schools.

These examinations will be conducted by examiners appointed by the Chancellor of Washington University.

*Inasmuch as the requirements preliminary to the study of medicine and to the registration of physicians vary somewhat in the different States, it is particularly enjoined upon students to conform in all respects to the special regulations governing admission to medical practice in the State in which they intend to reside.*

Students from undergraduate colleges who desire credit in inorganic and organic chemistry and histology must show certificates of the time spent in these branches and further must pass examinations in each one for which credit is sought.

Graduates in pharmacy from institutions having membership in the American Conference of Pharmaceutical Faculties will be given credit for their work in materia medica and pharmacy.\*

## THE ADMISSION OF STUDENTS FROM OTHER ACCREDITED MEDICAL COLLEGES.

### ADMISSION TO ADVANCED STANDING.

Applicants for admission to advanced standing must furnish evidence (1) that the foregoing terms of admission in regard to preliminary training have been fulfilled, (2) that courses equivalent in kind and amount to those given in this school, in the year or years preceding that to which admission is desired, have been satisfactorily completed, and (3) they must pass examinations at the beginning of the session in October† in all the subjects that have been already pursued by the class to which admission is sought. Certificates of standing elsewhere cannot be accepted in place of these examinations. The applicant must have studied as a matriculated medical student in an approved medical school for a period of time at least equal to that already spent by the class which he seeks to enter.

\* Credit for inorganic chemistry will be given to Graduates of the St. Louis College of Pharmacy.

† See Calendar: Admission to Advanced Standing.

Graduates of other medical schools who are permitted to enter this School with advanced standing as candidates for the degree are required (a) to pay the fees charged for the years in which they are in attendance, (b) to fulfill the requirements for graduation, as stated in this Announcement, and (c) to pass satisfactorily examinations in anatomy, chemistry, physiology and pathology.

Arrangements have been made with the Faculty of the Undergraduate Department of Washington University whereby students in that Department intending to enter the Medical School may elect in their A.B. course certain branches of the medical course. These subjects must be taken in the Medical School and the students will receive credit both in their A.B. and in their M.D. course for the grades assigned to them. By this means the time required for obtaining the two degrees may be shortened.

In this connection attention is called to the following courses which are offered to students in the Undergraduate Department of Washington University: —

Cytological Technique in the Shaw School of Botany.

Zoology 1 and 2: Biology, a combination of the elementary courses in zoology and botany designed to give students a broad one year's course in biology without specializing in either subject.

Zoology 3 and 4: Comparative anatomy and embryology of vertebrates.

Although work in this line cannot be accepted as the equivalent of any subject in the Medical School, students of the Undergraduate Department, who intend to study medicine, are advised to take it as preparatory to the medical course.



## GENERAL STATEMENT OF THE PLAN OF INSTRUCTION.

The course of medical study extends over a period of four years of eight months each.

The curriculum is based on the amount and kind of work required of the candidate for the degree of Doctor of Medicine. The courses are graded in such a manner that all the fundamental studies and general subjects must be taken before special courses and advanced work may be pursued. Of the latter a large part is elective, in order that the student may enjoy some liberty in the pursuit of higher studies and specialties.

The work required for the degree consists of obligatory courses, no account being taken of elective studies in the School records. Throughout the four years the classes are instructed separately in the clinics and laboratories as well as in the lecture-rooms. Sectional teaching and individual instruction form part of the required work of the third and fourth years.

Instruction by the practical methods of the laboratory, post-mortem room, day clinic and bedside take up about half the time of the whole course, the other half being given over to the conferences, recitations, informal talks and lectures as a means for aiding the student in systematizing and remembering the principles of medicine.

In the first year the work is limited to chemistry and anatomy. Nearly all of the time is spent in the laboratories in the study of inorganic chemistry, embryology, histology and gross and microscopical anatomy.

The work of the second year consists in a continuance of anatomical studies, physiology and organic and physiological

chemistry, pathology and bacteriology. The study of these branches is carried on almost entirely in the laboratory. In the second year the courses in materia medica and pharmacy and in therapeutics are introduced, and in the latter half the class begins the study of the normal physical signs.

General medicine and surgery naturally comprise the principal subjects of the last two years.

Medicine, surgery and obstetrics, begun in the third year, are each subdivided into graded courses. The principles of physical diagnosis are presented to the student in the medical and surgical clinics and in a well organized laboratory course of clinical chemistry and microscopy. Hygiene and sanitary science and some of the specialties are also introduced into this period of the course, such as diseases of children, neurology and ophthalmology, which are taught clinically and didactically, and lecture courses on the eruptive fevers, otology and gynecology in the last half of the year.

The studies of the fourth year are carried on mainly by sectional work in the clinics and at the bedside. Students are drilled in making diagnoses and in prescribing treatment. Cases attended during the week by certain students are discussed by the class. Each senior student is required to attend several obstetrical cases and to make obstetrical diagnoses at the Bethesda Maternity Hospital, Obstetrical Out-Clinic and the Washington University Lying-in-Hospital. Forensic medicine and sectional work in the special clinics, are included in the work of the last year.

In order to regulate the students' work and to ascertain the results of the teaching, examinations are held regularly at stated periods (see Calendar). *Good scholarship, which includes regular attendance and satisfactory work, is insisted upon and required of all students who expect to remain in the School for the degree.*

## DETAILS OF THE PLAN OF INSTRUCTION.

The Faculty reserves the right to make such changes as seem necessary, in the courses which follow.

### CHEMISTRY.

WILLIAM HOMER WARREN, Professor of Chemistry.

**CHEMISTRY A. — DESCRIPTIVE INORGANIC CHEMISTRY.** Professor Warren and Assistants. Eight hours weekly during the first semester.

This course is designed for beginners and for those who have some acquaintance with the subject. It is identical with the regular college course in general inorganic chemistry. The work of each week is divided between lectures, laboratory hours and an oral recitation. There are three lectures illustrated by experiments. These cover the more important elements and their compounds. Four hours are spent in the laboratory. In all eighty experiments, illustrating the fundamental principles of the science, are performed. The work of the lectures and of the laboratory is reviewed in a recitation. Written examinations are held frequently.

**CHEMISTRY B. — QUALITATIVE ANALYSIS.** Professor Warren and Assistants. Eight hours weekly during the second semester.

This course is designed for those who have taken Chemistry A or its equivalent. A few lectures to show the technique of analysis are given but the work is mainly practical. Thorough training is afforded in the separation and detection of bases and acids. Complete analyses of about twenty-five unknown substances, in-

cluding some of the more important inorganic compounds used in medicine, are made.

**CHEMISTRY C. — Quantitative Analysis.** Professor Warren and Assistants. Two hours weekly during the third Semester.

This course is designed for those who have taken courses A and B or their equivalent. The work is entirely practical. The essential principles of Volumetric Analysis are taught and practice in analyzing unknown solutions and solids is given.

**CHEMISTRY D. — Organic Chemistry.** Professor Warren. Three hours weekly during the third semester. Lectures and recitations.

**CHEMISTRY E. — Physiological Chemistry.** Professor Warren and Assistants. Four hours weekly during the third semester.

In a series of experiments the fats, carbohydrates, protein substances, saliva, gastric juice, pancreatic secretion, bile, etc., are studied. Especial attention is paid to the recognition of the important physiological proximate principles in unknown mixtures.

**CHEMISTRY F. — Toxicology.** Professor Warren and Assistants. Four hours weekly during the fourth semester.

Laboratory practice in the detection of all the common poisons.

## ANATOMY.

PAUL YOER TUPPER, Professor of Applied Anatomy.

ROBERT JAMES TERRY, Professor of Anatomy.

VILRAY PAPIN BLAIR, Associate Professor of Anatomy.

JAMES FRANCIS ABBOTT, Associate Professor of Embryology.

WILLIAM THOMAS COUGHLIN, Instructor in Anatomy.

The anatomical studies are carried on mainly in the laboratory, but most of the courses include some class-room work, such as conferences, demonstrations and lectures.

Since the majority of students have had no anatomical training before coming to the medical school it has been thought best to introduce a short course involving the study of some vertebrate

animal. This is accompanied by histology and embryology, so that these three general, fundamental subjects precede the special work on the human body.

Human anatomy is studied in a way which it is hoped will correlate the several branches of gross and fine anatomy, topography and development.

The anatomical laboratories and lecture room are on the fourth floor of the Locust Street Building and include two dissecting rooms, an osteological laboratory, museum and microscopical laboratory and study room.

First year students are provided each with a microscope and human skeleton and have access to the anatomical library. The museum is open all day and contains carefully prepared type-specimens of normal organs, Ziegler embryological models and a growing collection of structures which vary from the normal.

A stereopticon and Zeiss Epidiascope recently purchased are invaluable aids in teaching embryology and in demonstrating small preparations to a class.

The following courses are obligatory unless otherwise specified:—

A. The Vertebrate Type of Organization; laboratory work and lectures. 7 hours a week from October 1, to November 25. Prof. Terry.

C. Histology: the study of the cell and tissues. Laboratory work 8 hours a week from October 1, to November 25. Associate Prof. Abbott.

C. Vertebrate Embryology: this elementary course includes the study of the germ cells and the fundamental processes of early development. Laboratory and lectures, 8 hours a week from October 1, to November 25. Associate Prof. Abbott.

D. Locomotor Apparatus: the studies of myology, arthrology and osteology are carried on in the dissecting room, bone modeling room and microscopical laboratory. The course is accompanied by lectures on the living model. 23 hours a week from November 27, to February 10. Associate Prof. Blair and Dr. Coughlin.

E. Dissection of the Limbs, Chest and Abdomen: during the dissection of the chest and abdomen the organs of the visceral systems are studied from the standpoints of topography, coarse and fine structure and development. Laboratory work and lectures mornings and afternoons from February 12, to May 12. Prof. Terry, Associate Prof. Blair and Dr. Coughlin.

F. Nervous System and Sense Organs: dissection of the head and neck and the study of the development and fine structure of the brain, cord and sense organs. Lectures and laboratory work, 12 hours in the third semester. Prof. Terry and Associate Prof. Blair.

G. Applied Anatomy: three lectures a week in the fourth semester dealing with the application of anatomy in the practice of medicine. Prof. Tupper.

H. Medical Anatomy: This is an optional course open to upper class students and graduates. For particulars see Dr. Walter Baumgarten.

#### PHYSIOLOGY.

SIDNEY PAYNE BUDGETT, Professor of Physiology.

Physiology of the cell, of the Blood, of Muscle, Nerve, Spinal Cord and Peripheral Nerves, Autonomic Nervous System, Circulation, Respiration, Digestion, Metabolism, Excretion, Animal Heat, Central Nervous System and of the Special Sense. Three lectures, conferences or demonstrations each week; third and fourth semesters. Laboratory work, 4 hours a week during the third, and two hours a week during the fourth semester. Dr. Budgett and assistants.

#### PATHOLOGY AND BACTERIOLOGY.

ERNST FRIEDRICH TIEDEMANN, Professor of Pathology and Bacteriology.

R. WALTER MILLS, M.D., Instructor in Pathology and Bacteriology.

A, B. Lectures on General Pathology and Pathological Histology with Demonstrations, 3 hours during the second year. Prof. Tiedemann.

218 WASHINGTON UNIVERSITY MEDICAL DEPARTMENT.

C, D. Laboratory Work in Pathological Histology, 4 hours during second year. Prof. Tiedemann.

E. Demonstrations of Gross Pathological Anatomy and Exercises in Post-Mortem Examinations, 2 hours during second year. Obligatory for one semester, including one post-mortem examination with written report, or, in lieu thereof, reports on three post-mortems witnessed. Prof. Tiedemann.

F. Lectures on Bacteriology, 1 hour in 4th semester. Prof. Tiedemann.

G. Laboratory course in Bacteriology, 4 hours in 4th semester. Prof. Tiedemann and Dr. Mills.

H. Additional work may be taken in 6th and 8th semester as elective courses. Prof. Tiedemann.

MATERIA MEDICA AND PHARMACY.

HENRY MILTON WHELPLEY, Professor of Materia Medica and Pharmacy.

A. Materia Medica: Lectures and demonstrations, 2 hours in third semester. Professor Whelpley.

By means of statistics a list has been secured which contains the medicines most extensively prescribed at the present time including all of those mentioned by practitioners who instruct the students during the junior and senior years.

B. Practical Work in Pharmacy and Prescription Writing, 2 hours in the 4th semester. Professor Whelpley.

The practical work is confined to such technique as is of value to every physician. The prescription writing gives particular attention to incompatibilities and vehicles for the administration of chemicals and disagreeable medicines.

C. Palatable Prescribing; some lectures and demonstrations in the 8th semester. Elective. Professor Whelpley.

These lectures are based on prescription problems confronting the senior students in their clinical work.

# THERAPEUTICS.

GEORGE MARVINE TUTTLE, Professor of Therapeutics.

The course in Therapeutics consists in didactic lectures twice weekly throughout the second year, on the Physiological Action, and Therapeutic Applications of the various drugs and other remedies used in the treatment of disease. These are supplemented by monthly quizzes which are devoted largely to practical work in prescription writing, and to bringing out the main points of the subjects lectured on during the preceding month.

# MEDICINE.

GUSTAV BAUMGARTEN, Professor of the Practice of Medicine.

## PROFESSORS OF CLINICAL MEDICINE:

WASHINGTON E. FISCHER. JUSTIN STEER,  
WILLIAM C. GLASGOW.

## CLINICAL PROFESSOR:

ELSWORTH SMITH, JR.

## CLINICAL LECTURERS:

LOUIS H. BEHRENS, M.D. ALBERT E. TAUSSIG, M.D.  
HENRY S. BROOKES, M.D.

## INSTRUCTORS:

JESSE S. MYER, M.D. JOHN C. SALTER, M.D.  
WILLIAM H. RUSH, M.D. LOUIS M. WARFIELD, M.D.  
WALTER BAUMGARTEN, M.D. L. H. HEMPELMANN, M.D.  
C. A. W. ZIMMERMANN, M.D.

The course of medicine comprises a graded plan of study extending throughout three years. General didactic lectures upon



the practice of medicine are supplemented by bedside and dispensary instruction and recitations.

Medical Diagnosis is taught (1) by a year's laboratory work in Clinical Chemistry and Microscopy; and (2) by two practical clinical courses each of 2 hours a week for one semester, in normal Auscultation and Percussion, and in Physical Diagnosis.

The work in clinical chemistry and microscopy has been divided into four portions, namely: (1) The blood, (2) stomach contents and faeces, (3) chemical analysis and microscopic examination of the urine, (4) exercises in laboratory diagnosis of actual cases at the Washington University Hospital.

The class is divided into sections each of which in turn works at the four subdivisions of the course.

Internal medicine ("The Practice of Medicine") — exclusive of the Diseases of the Nervous System — is taught (1) by clinics (see below); and (2) by two lectures and one recitation a week during two years. The lectures are not intended to repeat the contents of any text-book, but are designed to complement the latter and assure the comprehension of its teachings, — by stress upon the pathogenesis of the disease, the origin and meaning of its symptoms and its sequence in the morbid process, the reciprocal influence of the disturbed functions of various organs on each other; and upon the rationale of methods of treatment and the indications for the use of remedial agents.

They are illustrated by pathological specimens, by colored plates and diagrams.

The study of Clinical Medicine begins in the second half of the second year with the above mentioned courses in normal auscultation and percussion, especial attention being given to topographical percussion, — which are preparatory to the courses in physical diagnosis of the third year.

During the third and fourth years the students spend from 4 to 7 hours a week in the dispensaries and hospitals connected with the School in case-taking, in learning diagnostic methods and in the bedside study of disease and treatment.

The work of the student is controlled by written reports and conferences and by examinations from time to time.

The course includes the following subdivisions: —

A. Exercises in Normal Auscultation and Percussions, 2 hours in the 4th semester. Clin. Prof. Smith.

B, C. Clinical Chemistry and Microscopical Diagnosis; Laboratory Work, 4 hours during the third year. Dr. Taussig, Dr. Myer, Dr. Rush, Dr. Walter Baumgarten, Dr. Salter and Dr. Warfield.

C. Exercises in Physical Diagnosis, 2 hours in the 5th semester. Clin. Prof. Smith.

E, F, G, H. Practice of Medicine; Lectures and Demonstrations 2 hours, and Recitations 1 hour, during the third and fourth year. Prof. Baumgarten.

I. Diseases of the Chest and Laryngology: 1 hour in the 7th semester. Prof. W. C. Glasgow.

#### CLINICAL MEDICINE.

General Medical Clinics will be held at the Hospitals connected with the School, and at the Out-Clinic Departments of the College Buildings. The University Hospital having 135 beds, two clinical amphitheaters, a clinical lecture room, clinical laboratories, a room for X-Ray diagnostic work and X-Ray therapy, furnishes excellent facilities for teaching. Medical clinics are held every day during the college year. The patients are assigned to students who take the histories of the cases, make the physical examination, the diagnosis and prognosis, and suggest the line of treatment. All this is done under the direction of the professor or instructor in charge. The clinical laboratories under the direction of the department of internal medicine, furnish facilities for the scientific study of cases. The character of this Hospital as well as that of the Mullanphy Hospital, which is affiliated with the School, is such that bedside

instruction is given to the seniors throughout the year. A medical case is assigned to every student who is required to work it up thoroughly. With collateral reading a carefully prepared paper is read before the professor in whose department the work is done, and before the class at the weekly conference. A full discussion is encouraged.

A practical course on the topographical anatomy of the Viscera of the Thorax and Abdomen in its relation to the physical examination of the organs of these regions — based on serial cross-sections of the cadaver — is given in sections to the senior class throughout the entire year.

General Medical Clinics are arranged as follows: (1) 2 hours in the 5th semester. Prof. Steer. (2) O'Fallon Dispensary, 1 hour in the 5th semester. Clin. Prof. Smith. (3) Washington University Hospital, 1 hour in the 6th semester. Prof. Fischel. (4) Washington University Hospital, 2 hours in the 6th semester. Dr. Behrens. (I) City Hospital, 1 hour during the fourth year. Prof. Fischel. (II) Mullanphy Hospital, 2 hours daily. Prof. Steer and Clin. Prof. Smith (Sections). (III) O'Fallon Dispensary, 1 hour in the 8th semester. Clin. Prof. Smith. (IV) Washington University Hospital, individual instruction in the clinic and medical conference, during the fourth year. Prof. Fischel.

#### SURGERY.

ELISHA HALL GREGORY, Professor of the Principles of Surgery.

HERMAN TUHOLSKE, Professor Practice of Surgery and Clinical Surgery.

PAUL YOER TUPPER, Professor of Operative Surgery.

NORMAN B. CARSON, Professor of Clinical Surgery.

HARVEY GILMER MUDD, Professor of Fractures and Dislocations and Clinical Surgery.

#### CLINICAL LECTURERS:

CHARLES HENRY DIXON, M.D.

HENRY C. HARTMAN, M.D.

INSTRUCTORS:

HENRY ARTHUR GEITZ, M.D.

WILLARD BARTLETT, M.D.

ERNST JONAS, M.D.

JOHN C. MORFIT, M.D.

A. Instruction in Minor Surgery and Bandaging, 2 hours in 5th semester. Dr. Geitz.

B. Demonstrations in Surgical Pathology, 2 hours in 6th semester. Dr. Bartlett.

The object of this course, which consists of two stereopticon demonstrations per week, is to bridge over for the student, the gap which exists between pathological anatomy and clinical surgery. It embraces a study of the gross as well as microscopic features of tissue regeneration and repair, the forms of inflammation which are of especial surgical interest, and of tumors. Etiology and leading clinical characteristics are touched upon where it is possible.

C. Lectures and Demonstrations on Fractures and Dislocations. Two hours in the 6th semester. Prof. Mudd.

D. Lectures on the Practice of Surgery, 3 hours in the 7th semester. Prof. Tuholske.

E. Lectures on Operative Surgery, with exercises on the cadaver, 2 hours in the 8th semester. Prof. Tupper.

Members of the senior class are required to perform operations on the cadaver under the supervision of the professor in charge.

F. Lectures on the Surgery of the Brain and Spinal Cord, 1 hour in the 8th semester. Prof. Carson. The subject is illustrated by an extensive collection of lantern pictures.

G. Lectures on special topics. Elective. Prof. Gregory.

CLINICAL SURGERY.

(1) Washington University Hospital, one afternoon in the 5th semester. Opportunity is given students for minor surgical work

and assisting in the major operations. Prof. Tuholske. (2) Mullanphy Hospital, 2 hours in the 5th semester and in 6th semester. Profs. Gregory and Carson. The class is divided into sections to which cases are assigned in the wards of the hospital, so that the students receive bed-side instruction. (3) O'Fallon Dispensary, 1 hour in the 6th semester. Professor Mudd. (4) Surgical Exercises, sections of the class, throughout the fifth semester. Dr. Dixon. (5) Practical work in Surgical Dressing, in sections, during third year. Dr. Schlueter. (I) Mullanphy Hospital, 12 hours in 7th and 1 hour in 8th semester. Prof. Carson. (II) Washington University Hospital, 12 hours during the fourth year. Prof. Tuholske. (III) City Hospital, 1 hour during fourth year. Profs. Tuholske, Carson and Mudd.

#### OBSTETRICS.

HENRY SCHWARZ, Professor of Obstetrics.

EDWARD WATTS SAUNDERS, Professor of Clinical Midwifery.

GEORGE GELLHORN, Instructor in Gynecological and Obstetrical Microscopy.

A. Lectures on Obstetrics with Demonstrations, 2 hours in the third year. Prof. Schwarz.

B. Lectures on Gynecological and Obstetrical Microscopy, 1 hour in the 6th semester. Dr. Gellhorn.

C, D. Operative Obstetrics and exercises on the manikin, 1 hour in the fourth year. Prof. Schwarz.

(I) Obstetrical and Gynecological Clinic at the O'Fallon Dispensary, 3 hours in the fourth year, for sections of ten. Prof. Schwarz.

(II) Obstetrical Clinic at the Bethesda Hospital, by appointment, during the fourth year. Prof. Saunders.

(III) Obstetrical Out-Clinic, by appointment during the fourth year. Prof. Schwarz.

Instruction in Obstetrics will be given during third and fourth years by —

1. Lectures. 2. Attendance on cases of confinement. 3. Manikin practice and section work. 4. Obstetric histology, pathology and bacteriology.

Illustrative lectures comprise a systematic course, running through the third year upon the Histology, Embryology, Physiology and Pathology of the maternal generative organs and foetus.

These lectures are theoretical to a limited extent only, being demonstrative and illustrative in character. To this end are utilized abundant collections of pelves, entire, normal and deformed, mesial sections of the same, and carefully selected plaster, composition and metal models, and instruments.

Manikin practice is given to sections of the class during the fourth year and consists of work by individual students upon the manikins including: the mechanical phenomena of labor; modes of delivery; abnormal presentations and positions, with methods of delivery of each; version, application of the forceps, and other manipulations.

Attendance upon cases of confinement: Each candidate for the degree is required to present satisfactory evidence to the effect that he has attended a definite number of cases of confinement. Students will attend confinement cases under the supervision of the physician in charge of the Maternity Department.

## SPECIAL DEPARTMENTS OF MEDICINE AND SURGERY.

### DISEASES OF CHILDREN.

ROBERT LUEDEKING, Prof. Diseases of Children.

EDWARD WATTS SAUNDERS, Prof. Diseases of Children.

JOHN ZAHORSKY, M.D., Clinical Lecturer on Diseases of Children.

W. L. JOHNSON, Instructor in Clinical Pediatrics.

A, B. Lectures and Demonstrations on Diseases of Children, 2 hours during the third year. Prof. Luedeking.

C. Lectures on Diseases of Infants, 1 hour in the 7th semester. Prof. Saunders.

*Clinics* for Diseases of Children are held at; (1) O'Fallon Dispensary, 1 hour in the 5th and 6th semester. Prof. Luedeking. (2) Bethesda Hospital, 1 hour in the 6th semester. Prof. Saunders. (I) Bethesda Hospital, 12 hours in the 7th and 8th semester. Prof. Saunders and Prof. Luedeking. (3) Washington University Hospital, 1 hour during the third year and (II) Washington University Hospital, 1 hour during the fourth year. Elective. Dr. Zahorsky.

### DISEASES OF THE NERVOUS SYSTEM.

FRANCIS RHODES FRY, Professor of Diseases of the Nervous System.

GIVEN CAMPBELL JR., M.D., Clinical Lecturer on Diseases of the Nervous System.

M. A. BLISS, M.D., Instructor in Clinical Neurology.

A. Lectures on Diseases of the Nervous System, 2 hours in the 6th semester. Prof. Fry.

*Clinics* for Diseases of the Nervous System will be conducted as follows: (1) Washington University Hospital, 1 hour in the 5th semester. Dr. Campbell. (2) O'Fallon Dispensary, 1 hour in the 6th semester. Prof. Fry. (I) O'Fallon Dispensary, 1 hour during the fourth year. Prof. Fry. (II) City Hospital, 1 hour during the fourth year. Dr. Campbell.

(III) Insane Asylum: Clinic for Mental Diseases, 2 hours (one forenoon) in the 8th semester. Prof. Fry and Dr. Bliss. (IV) Courses (1) and (2) are elective in the senior year.

Professor Fry will give 34 didactic lectures to the third year students, on the etiology, symptomatology and diagnosis of diseases of the nervous system, also the various modes of treatment. This course gives a general outline of the work for the clinical courses which follow.

Clinical demonstrations are given by Dr. Campbell at the Washington University Hospital and City Hospital, and by Professor Fry at the O'Fallon Dispensary.

Professor Fry and Dr. Bliss will conduct a clinic for mental diseases once a week during the 8th semester at the Insane Asylum.

#### ORTHOPEDIC SURGERY.

A. J. STEELE, Professor of Orthopedic Surgery.

PHILIP HOFFMAN, M.D., Clinical Lecturer on Orthopedic Surgery.

FRED. B. HALL, M.D., Instructor in Orthopedic Surgery.

NATHANIEL ALLISON, M.D., Instructor in Orthopedic Surgery.

A. Lectures on Orthopedic Surgery, 1 hour in the 6th semester. Prof. Steele.

Clinical instruction in this subject is offered: (1) At the Washington University Hospital, 1 hour in the 7th semester. Prof. Steele. (II) At the O'Fallon Dispensary, 1 hour in the fourth year. Dr. Hoffman.

ORTHOPEDIC SURGERY will be taught didactically and by recitation to the third year class, and clinically to the senior class.



Congenital and acquired deformities, tuberculous and chronic deforming joint diseases, and loss of muscular function from the neuroses will all be fully considered and made plain by cases from practice.

The uses of plaster of Paris in its manifold application will be taught, the construction of braces illustrated, and the surgical operative procedures—as of tenotomy, osteotomy, osteoclasis, tendon transplantation, etc., will be done before the class.

#### DERMATOLOGY.

W. A. HARDAWAY, Professor of Diseases of the Skin and Syphilis.

JOSEPH GRINDON, Professor of Clinical Dermatology and Syphilis.

A. Lectures on Diseases of the Skin and Syphilis, with clinical demonstrations, 1 hour in the 5th semester. Prof. Hardaway.

B. Lectures on the Eruptive Fevers, Vaccination and Cutaneous Syphilis, 1 hour in the 6th semester. Prof. Grindon.

Clinical instruction in Dermatology and Syphilis will be given at: (1) the Washington University Hospital, 1 hour in the 8th semester, by Prof. Hardaway; and O'Fallon Dispensary, 1 hour in the 7th semester, by Prof. Grindon.

The instruction given in dermatology and syphilography is partly didactic and partly clinical. It is fully recognized that any familiar knowledge of these branches can be obtained only in the actual work of the dispensary or hospital; nevertheless, a considerable part of what may be termed the elements of these subjects, that is to say, the general consideration of symptoms, causes, therapeutics, etc., should be imparted to the student as a preliminary to the clinic. Such subjects are treated didactically in the third year of the student's course. In addition, certain general diseases, *e. g.*, leprosy, the exanthemata, syphilis, are sufficiently discussed, and especially in relation to their diagnosis and their medico-social bearings.

The important subject of Vaccination, its history, clinical phenomena and mode of application, is exhaustively treated.

In the fourth year students are quite thoroughly drilled in practical clinical work. In addition to instruction by lectures, the classes are divided into small sections, and then again so subdivided that to each three or four men is assigned a patient for study. At the next conference a written report is made of each case and fully discussed before the class. An opportunity is also offered for a certain amount of pathological work in dermatology to such students as may desire it.

#### GYNECOLOGY.

FRANK A. GLASGOW, Professor of Clinical Gynecology.

HENRY S. CROSSEN, M.D., Clinical Professor of Gynecology.

DR. WILLIS HALL, Clinical Lecturer on Venereal Diseases of Women.

The instruction in Gynecology includes: —

A comprehensive Lecture Course, dealing in a systematic way with the Diseases of Women.

Clinic Courses, in which the senior students are required, under the eye of the instructor, to make careful and systematic examinations, to make diagnoses and sustain them under criticism, to carry out the minor details of treatment and to witness the various gynecological operations.

A Phantom Course and Quiz. This is an extra drill upon the essential points in gynecologic examination, diagnosis and treatment. It is open to the seniors. An important part of it is the examinations and minor operations on the Phantom (a phantom pelvis containing natural organs, of which there are many sets both normal and abnormal, removed post-mortem for this purpose and properly preserved).

There is also elective work for senior students.

The instruction in gynecology is arranged in the following courses: —

A. Lectures and Demonstrations, 2 hours in the 6th semester.  
Prof. F. A. Glasgow.

B. Lectures and Demonstrations, 2 hours in the 8th semester  
Clin. Prof. Crossen.

*Clinics:* (I) Washington University Hospital, 3 hours during fourth year for sections of the class. Clin. Prof. Crossen; and Mullanphy Hospital, 2 hours during the fourth year. Prof. F. A. Glasgow. (II) O'Fallon Dispensary, Clinic for Venereal Diseases of Women, 1 hour in fourth year. Elective. Dr. Willis Hall.

#### GENITO-URINARY SURGERY.

EDWIN C. BURNETT, Clinical Professor of Genito-Urinary Diseases.

H. MCC. JOHNSON, Clinical Professor of Genito-Urinary Surgery.

W. M. ROBERTSON, Instructor in Genito-Urinary Surgery.

In the department of Genito-Urinary Surgery the students have the advantage of a large out-clinic at the O'Fallon Dispensary where daily clinics are held. At the St. Louis Mullanphy Hospital the privilege is presented of doing individual work in kidney, ureteral and bladder technique, in the wards and operating room.

A. Lectures on Genito-Urinary Surgery, 2 hours in the 7th semester. Clin. Prof. Johnson.

*Clinics.* (I.) Genito-Urinary Surgery, O'Fallon Dispensary, one hour in the fourth year. Clin. Prof. Johnson.

(II.) Genito-Urinary Diseases. O'Fallon Dispensary, two hours in the 7th and one in the 8th semester. Clin. Prof. Burnett.

OPHTHALMOLOGY.

JOHN GREEN, Special Professor of Ophthalmology.

HENRY LINCOLN WOLFNER, Clinical Professor of Diseases of the Eye.

ARTHUR EUGENE EWING, Clinical Professor of Diseases of the Eye.

JOSEPH W. CHARLES, Instructor in Pathological Histology of the Eye.

WILLIAM A. SHOEMAKER, Instructor in Ophthalmoscopy.

M. WIENER, M.D., Instructor in Ophthalmology.

A. B. Lectures on the Principles of Ophthalmology, 1 hour in the 6th and 7th semesters. Prof. Green and Clin. Prof. Ewing. Clinics for Diseases of the Eye:—

(1) O'Fallon Dispensary, 1 hour in the 6th semester. Clin. Prof. Ewing, Dr. Charles and Dr. Shoemaker.

(2) Washington University Hospital, 1 hour in the 6th semester. Elective. Clin. Prof. Wolfner.

(1) O'Fallon Dispensary, 1 hour in the fourth year, including Ophthalmoscopy and Pathological Histology of the Eye. Clin. Prof. Ewing, Dr. Charles and Dr. Shoemaker. (II) Washington University Hospital, 1 hour in the fourth year. Clin. Prof. Wolfner.

OTOLOGY.

HORATIO N. SPENCER, Professor of Otology.

JOHN BLASDEL SHAPLEIGH, Professor of Otology.

DAVID C. GAMBLE, Clinical Professor of Diseases of the Ear.

SELDEN SPENCER, Instructor in Otology.

A. F. KOETTER, M.D., Instructor in Otology.

A. Lectures on Diseases of the Ear, with Clinical Demonstrations, 1 hour in the 6th semester. Prof. Spencer.

Weekly lectures for one hour in the 6th semester. These lectures present the surgical anatomy of the ear and nose, the physiology of these organs, the methods of examination, the more

## 232 WASHINGTON UNIVERSITY MEDICAL DEPARTMENT.

important diseases and the therapy and surgical treatment of nasal and aural affections.

Clinical courses in this branch are conducted as follows:—

- (I) O'Fallon Dispensary, 1 hour for half the fourth year. Prof. Shapleigh; and at the Washington University Hospital, 1 hour for half the fourth year. Prof. Spencer and Prof. Gamble.  
(II) An Elective Course, 2 hours during the fourth year will be given at the above-mentioned clinics.

### LARYNGOLOGY AND RHINOLOGY.

WILLIAM CARR GLASGOW, Professor of Clinical Medicine and Laryngology.

EDGAR MOORE SENSENEY, Professor of Diseases of the Nose, Throat and Chest.

GREENFIELD SLUDER, Clinical Lecturer on Diseases of the Nose, Throat and Chest.

Diseases of the Chest and Laryngology: Clinical Lectures, 1 hour in the 7th semester. Prof. W. C. Glasgow.

Clinical Instruction in Diseases of the Nose, Throat and Chest is given to sections of the class:—

- (I) At the St. Louis Mullanphy Hospital, 2 hours in the 7th and 8th semesters, by Prof. Senseney; and Diseases of the Nose and Throat at the O'Fallon Dispensary, 2 hours in the 7th and 8th semesters, by Dr. Sluder. (II) At the Washington University Hospital, Laryngology, 1 hour in the 8th semester. Prof. W. C. Glasgow.

### DEPARTMENT OF HYGIENE.

LLEWELLYN P. WILLIAMSON, M.D., Captain, Asst. Surgeon U. S. Army, Lecturer on Hygiene and Sanitary Science.

Lectures and demonstrations on Hygiene and Sanitary Science, 2 hours in in the 6th semester.

HYGIENE AND SANITARY SCIENCE.

The course in hygiene and sanitary science is designed to bring clearly and concisely before the student those fundamental hygienic principles which enable the physician to intelligently combat disease-producing conditions in the individual patient and his surroundings, or in communities at large. The course is conducted by a series of lectures and explanatory quizzes, supplemented, wherever possible, by illustrations and the exhibition of the various apparatus used in sanitary work.

All subjects bearing on the general maintenance of good health: water, food, climate; the construction, ventilation, heating, and lighting of buildings; the character of soils; principles of clothing; effects of exercise; disposal of excreta, sewage, and refuse; the origin and transmission of the infective diseases. Disinfection and quarantine are treated in detail, their relation to disease discussed, and the necessity for the observance of sanitary laws impressed.

FORENSIC MEDICINE.

Courses of Lectures comprising the following subjects will be given during the 8th semester, three hours a week: —

Symptoms and Treatment of poisoning, 4 lectures, Prof. — Microscopy of blood Stains, Hair, etc., 1 lecture by Prof. Terry; Abortions, Diagnosis of Recent Labor, Rape, etc., 4 lectures by Prof. Schwartz; Legal Aspects of Insanity, Injuries to the Nervous System, Alcoholism, Sunstroke, etc, 3 lectures by Prof. Fry; Legal Aspects of Traumatism and Surgical Injuries, 3 lectures by Prof. Tuholske; Post-mortem Examinations, 2 lectures by Prof. Tiedemann; Medical Jurisprudence, 12 to 15 lectures by Prof. Nagel.

### ELECTIVE COURSES.

Opportunity for the pursuit of elective work is afforded in nearly every branch represented in the third and fourth years of the curriculum, and moreover students of the last two years are permitted to undertake advanced work in the subjects of the first four semesters.

No record will be kept of work elected and such courses shall not count toward the degree. In selecting these studies, students must so arrange that no conflict with prescribed work shall occur.

Instructors in charge of elective courses will post notices of the semesters, days and hours when the work is to be conducted.

### GRADUATE COURSES.

The rapid development of medical science has necessitated the introduction of many new subjects into the curriculum, and this has led practitioners, who wish to keep abreast of the times, to return to the Medical Department in order to take special courses in the newer subjects. The frequency of requests for advanced work has induced the Faculty to admit medical graduates to any one or more of the regular courses when such graduates give evidence of their ability to profit by such instruction. In such cases the graduate student must pay fifty dollars tuition in addition to the ordinary expenses of any laboratory courses taken.

Clinical instruction is given in the Washington University Hospital, in the Washington University Hospital Dispensary, O'Fallon Dispensary, Mullanphy Hospital and the out-patient department of that institution, Bethesda Hospital and the eleemosynary institutions of the city. These afford an abundance of clinical material.

In the Locust Street Building is a Medical Library with sets of medical periodicals. Some of the special laboratories possess libraries which are available for the use of graduate students.

The opportunities are numerous for clinical work combined with the studies in the several laboratories. For full details of the clinical instruction see the various divisions in the Details of the Plan of Instruction.



## PROMOTION.

At the end of the First Year: —

A student, candidate for the degree, will be promoted to the Second Year Class, if having attended regularly the courses of the first year he has no more than one condition in a laboratory course and one condition in a lecture course.

A condition in a laboratory course and in one of the lecture courses specified must, however, be made up by the end of the fourth semester.\*

At the end of the Second Year: —

A student will be promoted to the Third Year Class whose work throughout the First and Second Years has been generally satisfactory.

A student cannot enter the Third Year Class with a condition and he is allowed until the following fall to remove any he may have.\*

At the end of the Third Year: —

A student will be promoted to the Senior Class, if he has attended regularly the lectures, clinics and other required courses of the Third Year; if he has received credit for the practical courses in Medicine and Surgery; if he has satisfactorily passed examinations in the lecture courses of Medicine, Surgery and Obstetrics; and if he has been accredited with a majority of all other branches taught in this year.

At the end of the Senior Year a student will be graduated subject to the conditions named under "Requirements for Graduation."

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\* Examinations for removal of conditions will be held in the fall and spring. (See Calendar.)

### REQUIREMENTS FOR GRADUATION.

1. The candidate must be twenty-one years of age.
  2. He must be of good moral character (which includes unexceptionable conduct while at this School).
  3. He must have fulfilled the requirements for entrance.
  4. He must have attended not less than four annual courses of medical instruction as a regular matriculated medical student, the last of which must have been in this School.
  5. He must, by the first of April, have notified the Dean, in writing, of his intention to present himself as a candidate for the degree.
  6. He must have discharged all indebtedness to the School.
  7. He must have taken all obligatory courses offered here, or their equivalent, and have done satisfactory work in all of them.
- At the end of the Fourth Year every student, who has fulfilled these requirements, will be recommended for the degree of Doctor of Medicine.

### PRIZES.

Two "GEORGE F. GILL Prizes" are offered to the students of the School, viz. : —

1. One prize of fifty dollars to be awarded at the end of the First Year to the member of the class who shall have made the highest grade in anatomical work assigned to the First Year class.

At the discretion of the Professor of Anatomy other students of the First Year who shall have done excellent work in Anatomy may be awarded "Honorable Mention" at Commencement. The names of those students thus chosen will be printed in the Announcement.

2. One prize of fifty dollars to be awarded to a member of the graduating class, of high general standing, who shall have done specially good work in the department of Diseases of Children.

3. A CURTMAN prize will be awarded at the end of the First Year to the member of the class who shall have made the highest grade in Chemistry.

At the discretion of the Professor of Chemistry other students of the First Year who shall have done excellent work in Chemistry may be awarded "Honorable Mention" at Commencement. The names of those students thus chosen will be printed in the Announcement.

### SCHOLARSHIPS.

1. The GEORGE F. GILL SCHOLARSHIP, instituted in memory of the late Dr. George F. Gill, Clinical Professor of Diseases of Children, entitles the holder to one year's free tuition.

### ASSISTANTSHIPS.

From ten to twelve positions as laboratory assistants in the courses in Chemistry, Anatomy, Histology, Pathology, Bacteriology and Pharmacy are awarded to students of high standing who have been in attendance for more than one year. The salary attached to these positions is never more than fifty dollars for each session and is dependent upon the amount of work required of the student.

### CO-OPERATIVE ASSOCIATION.

By becoming members of this Association students are enabled to decrease their living expenses in many ways. Membership cards may be obtained at the School Book Store, a department

of the Association where students can obtain the text-books and other supplies needed in the course. As the profits of this store are used in the development of a library for the Medical School, the faculty, instructors, students and all others in connection with this department of the University are urged to give it their patronage.

## THE YOUNG MEN'S CHRISTIAN ASSOCIATION.

This organization has for its chief aim the development of the religious life of the institution and secondarily to promote the interests of the student in every other way possible. The Association is non-sectarian and invites the co-operation of men of all Christian denominations. It seeks to contribute to the social life of the student body by providing a room where men may meet and become acquainted. In its rooms the daily papers, weekly and monthly magazines, writing materials and various forms of amusement are at the disposal of those who desire them.

The Association makes a special effort to be of service to new men. Its information bureau answers questions which men strange to the School have to ask. It secures desirable boarding places for them and endeavors to obtain employment for such as desire it. In order to enable the freshmen to meet the oldest students a reception, to which all students are invited, is given early in the year.

The affairs of the Association are managed by a board of officers, elected from the student body, under the supervision of the State Association. A student secretary, who receives a salary in addition to his tuition, is in immediate charge at the building. Weekly religious services are held, at which men of prominence from St. Louis and other places address the students. The organization has been in existence for two years only and already more than one-fourth of the men of the institution are enrolled in its membership.

## FEES AND EXPENSES.

### TUITION.

All fees and charges are payable at the office of the Registrar. All checks should be made payable to the order of the Medical Department of Washington University.

Each student, before he can register, will be charged a matriculation fee of five dollars, which is payable but once during the course of four years. In addition an annual tuition fee of one hundred dollars will be charged, and this is payable at the beginning of each session.

If at the end of the session a student shall have left unpaid any portion of his tuition fee, or other expenses he may have incurred, he will not be considered in good standing. In case he is a candidate for the degree, he will not be admitted to the final examinations; or, if he is a member of one of the three lower classes, his grades will be withheld and no certificate of attendance will be issued to him until he shall have discharged his indebtedness to the School.

When a student enters the School and pays the required fees, it is taken for granted that he has given the matter due consideration, and that he is prepared to pursue the course of study prescribed. The Faculty stands ready to perform its part of the work as laid down in the curriculum. For these reasons fees once paid by students cannot for any cause whatsoever be refunded or transferred. A student, however, who has paid his tuition fee and for good reason is unable to complete the session, will be given credit for the amount, and upon his return to School at some subsequent time, he will not be required to pay the same fee a second time.

## LABORATORY FEES AND OTHER CHARGES.

At the beginning of the session special fees are charged to cover the cost of materials and apparatus used in the laboratories. No portion of these fees is refunded. Students are further required to make good any loss resulting from damage or breakage of apparatus. Students must supply their own padlocks for the lockers provided for clothing and apparatus and the School will not assume any responsibility for any loss of property.

No fees will be charged for demonstrators' or hospital tickets or for graduation.

Each student in the first year is required to pay to the Registrar of the College eight dollars (\$8.00) to cover breakage in the laboratories and as guarantee for the use of a skeleton. Each student of the second and third years will be required to pay to the Registrar five dollars (\$5.00) to cover breakage in the laboratories. This sum, less the amount charged against it for breakage, will be returned at the end of each year. Tickets must be taken out and paid for at the beginning of the session.

## FIRST YEAR.

**CHEMICAL LABORATORY.** A laboratory fee of five dollars will be charged in General Chemistry and Qualitative Analysis. The average additional charge for breakage is about three dollars.

**ANATOMICAL LABORATORIES.** A fee of five dollars will be charged for the use of anatomical material issued for dissection.

**HISTOLOGICAL LABORATORY.** A fee of five dollars will be charged for the use of a microscope and for material supplied in Histology. A student will be held responsible for damage to his microscope, or for loss of parts and will be expected to pay the cost. A student using his own microscope will be charged only three dollars.

## 242 WASHINGTON UNIVERSITY MEDICAL DEPARTMENT.

**EMBRYOLOGICAL LABORATORY.** A fee of two dollars and a half will be charged to cover the cost of material.

An annual rental fee of twenty-five cents will be charged for a locker.

### SECOND YEAR.

**CHEMICAL LABORATORY.** A laboratory fee of five dollars will be charged in Physiological Chemistry. The average additional charge for breakage is about one dollar.

**ANATOMICAL LABORATORY.** A fee of two dollars and a half will be charged for use of material.

**PHYSIOLOGICAL LABORATORY.** A fee of five dollars will be charged to cover the cost of material used.

**PATHOLOGICAL LABORATORY.** A fee of five dollars will be charged for the use of a microscope and for material supplied in Pathology and Bacteriology.

**PHARMACEUTICAL LABORATORY.** A fee of one dollar will be charged for laboratory work in Pharmacy. An additional charge will be made for breakage.

### THIRD YEAR.

**CHEMICAL LABORATORY.** A laboratory fee of five dollars will be charged in Urinology and for the use of a microscope in Microscopical Diagnosis. An additional charge will be made for breakage.

### FOURTH YEAR.

A fee of one dollar will be charged for material for the courses in operative surgery and in fractures and dislocations.

### FEES OF ALUMNI, GRADUATES OF OTHER MEDICAL SCHOOLS, AND SPECIAL STUDENTS.

Graduates of the Saint Louis Medical College, of the Missouri Medical College and of the Medical Department of Washington

University have a perpetual free admission. The privilege entitles the holder to attend all lectures and clinics. Should he wish to take any course in which laboratory work is given, he will be charged the specified fee.

Graduates of other medical schools will be charged the matriculation fee of five dollars, and a tuition fee of fifty dollars for attendance during a session or for any part of a session. For all courses in which laboratory work is given the specified fees will be charged in addition.

Students who may wish to take special courses of study not covered by any of the above clauses, are requested to make written application to the Dean, stating plainly the nature of the work they wish to do and the length of time they expect to be in attendance.

#### SUMMARY OF EXPENSES FOR THE FOUR YEARS' COURSE.

The actual fees charged for each year's attendance at the school are as follows: —

	First Year.	Second Year.	Third. Year.	Fourth Year.
Matriculation.....	\$ 5 00	\$.....	\$.....	\$.....
Tuition .....	100 00	100 00	100 00	100 00
Chemistry .....	5 00	5 00	5 00	.....
Breakage (estimated).....	3 50	1 50	1 00	.....
Anatomy .....	5 00	2 50	.....	.....
Histology .....	5 00	.....	.....	.....
Embryology .....	2 50	.....	.....	.....
Physiology .....	.....	5 00	.....	.....
Pharmacy.....	.....	1 00	.....	.....
Pathology.....	.....	5 00	.....	.....
Surgery.....	.....	.....	.....	1 00
Locker.....	25	25	25	25
Total.....	\$126 25	\$120 25	\$106 25	\$101 25

Thus for residence in St. Louis during four annual sessions of thirty-five weeks each and for attendance at the Medical Depart-



**244 WASHINGTON UNIVERSITY MEDICAL DEPARTMENT.**

ment, exclusive of the cost of instruments, clothing, amusements and incidentals, a conservative estimate would be: —

	<b>First Year.</b>	<b>Second Year.</b>	<b>Third Year.</b>	<b>Fourth Year.</b>
<b>School.....</b>	<b>\$126 25</b>	<b>\$120 25</b>	<b>\$106 25</b>	<b>\$101 25</b>
<b>Books.....</b>	<b>25 00</b>	<b>25 00</b>	<b>25 00</b>	<b>25 00</b>
<b>Room-rent.....</b>	<b>52 50</b>	<b>52 50</b>	<b>52 50</b>	<b>52 50</b>
<b>Board.....</b>	<b>122 50</b>	<b>122 50</b>	<b>122 50</b>	<b>122 50</b>
<b>Total.....</b>	<b>\$326 25</b>	<b>\$320 25</b>	<b>\$306 25</b>	<b>\$301 25</b>

# STUDENTS.

## FIRST YEAR CLASS.

NAME.	RESIDENCE.
Abaza, Sayid Bahgat . . . . .	Zagazig, Egypt.
Barry, James J. . . . .	St. Louis, Mo.
Bechtold, Frederick William . . . . .	Bellaire, Mich.
Bialock, Samuel . . . . .	St. Louis, Mo.
Black, Grover Cleveland . . . . .	Rushville, Ill.
Blackard, William James . . . . .	Ridgway, Ill.
Bollinger, Oscar Walter . . . . .	Steelville, Ill.
Brand, Eli Thomas . . . . .	Bonne Terre, Mo.
Briggs, Guy Young . . . . .	St. Louis, Mo.
Burdick, Jesse Jerome . . . . .	Roodhouse, Ill.
Catto, William Bruce . . . . .	Decatur, Ill.
Chapman, William Day . . . . .	White Hall, Ill.
Davis, Frank L. . . . .	Pawnee, Ill.
Dew, Walter Albert . . . . .	Belleville, Ill.
DuBois, Henry Harry Slaton . . . . .	Greensboro, Ala.
Duey, Delmer Roy . . . . .	Winfield, Mo.
Duncan, George Washington . . . . .	Iberia, Mo.
English, Milton Tate . . . . .	Paris, Mo.
Ewerhardt, Frank Henry . . . . .	St. Louis, Mo.
Feinstein, Leon Aaron . . . . .	St. Louis, Mo.
Goodpasture, Lloyd E. . . . .	Virden, Ill.
Gore, Victor Maurice . . . . .	Carlinville, Ill.
Gossard, Gary Thomas . . . . .	Golconda, Ill.
Guerrero, Alfred A. B. . . . .	Manila, P. I.
Gundelach, Charles Armin . . . . .	St. Louis, Mo.
Hardy, Bert Witham . . . . .	Griggsville, Ill.
Hays, George Renwick . . . . .	Houston, Ill.
Helmy, Daúd . . . . .	Alexandria, Egypt.

# 246 WASHINGTON UNIVERSITY MEDICAL DEPARTMENT.

NAME.	RESIDENCE.
Hempelman, Theodore Carl . . . . .	St. Louis, Mo.
Herskovitz, Samuel . . . . .	St. Louis, Mo.
Hewitt, Walter Roy . . . . .	St. Louis, Mo.
Hill, Halbert Rowland . . . . .	Fulton, Mo.
Hobson, Abraham Dana . . . . .	Fayette, Mo.
Hurford, Phelps Grant . . . . .	Pueblo, Colo.
Kesl, George Matthew . . . . .	St. Louis, Mo.
Klocke, Frank W. . . . .	St. Louis, Mo.
Long, James Franklin . . . . .	Hannibal, Mo.
Lozi, Abdel Rahman . . . . .	Damietta, Egypt.
McCoy, Gurley C. . . . .	Lake, Ind.
Mills, James F. . . . .	Chicago, Ill.
Olds, Wilson Albert . . . . .	Medical Lake, Wash.
Raeder, Oscar Jacobus . . . . .	St. Louis, Mo.
Rich, Harry . . . . .	St. Louis, Mo.
Roeslin, Fred. Leo . . . . .	Oakland, Mo.
Sandperl, Harry . . . . .	St. Louis, Mo.
Shaw, Albert Rodney . . . . .	Louisiana, Mo.
Sheets, John S. . . . .	Owen, Mo.
Simmons, Morris Samuel . . . . .	Jerseyville, Ill.
Smith, Henry Joseph, A.B. . . . .	Wendell, Ill.
Stiehl, Elmer Phillip . . . . .	Belleville, Ill.
Stone, Charles Allen, B.Sc. . . . .	Shipman, Ill.
Sturgis, Walter E. . . . .	Kennett, Mo.
Tilles, Randall Solon . . . . .	South McAlester, I. T.
Viley, Leland Peak, A.B. . . . .	Marshall, Mo.
Westermeler, George Washington . . . . .	Carlinville, Ill.
Young, Henry McClure, A.B. . . . .	St. Louis, Mo.
Zaki, Yousef . . . . .	Zagazig, Egypt.
Total, 57.	

## SECOND YEAR CLASS.

Bartels, Leo George . . . . .	Cape Girardeau, Mo.
Bowles, John Anderson. . . . .	Lanes Prairie, Mo.
Brandt, Benjamin . . . . .	Cappeln, Mo.
Clark, Hiram Jackson . . . . .	Richmond, Mo.
Cordonnier, Louis Joseph . . . . .	East St. Louis, Ill.
Courtright, John Leslie . . . . .	Yakima City, Wash.

NAME.	RESIDENCE.
DeLong, William Allen . . . . .	Batchtown, Ill.
Dixon, Charles Hall . . . . .	Wichita, Kans.
El-Gazelle, Raddad Shehdan . . . . .	Beirut, Syria.
Farrar, Charles B . . . . .	Marquand, Mo.
Freels, Arthnr McDonald . . . . .	E. St. Louis, Ill.
Fronske, Martin George . . . . .	St. Louis, Mo.
Gipson, Emmett Herbert . . . . .	Lagonda, Mo.
Gray, Robert Quincy . . . . .	California, Mo.
Hill, Lawrence Henry . . . . .	Paragould, Ark.
Jackson, Frank F. . . . .	Stratberry, Ont., Canada.
Jameson, Charles Howard . . . . .	St. Louis, Mo.
Jones, Walter Matthew . . . . .	Brookfield, Mo.
Kerwin, William . . . . .	Graniteville, Mo.
Kluegel, William . . . . .	St. Louis, Mo.
Lemmon, George Bruce, B.S.D. . . . .	Warrensburg, Mo.
Lewis, Harry Overton . . . . .	Iuka, Ill.
Liston, Joseph Burt . . . . .	Carlinville, Ill.
Luckey, Frank Seymour . . . . .	Festus, Mo.
Ludwigs, Gustav Anton John . . . . .	East St. Louis, Ill.
Lund Herlup Gyde . . . . .	Soro, Denmark.
MacLean, S. M. . . . .	Tacoma, Wash.
McCubbin, James Burlington . . . . .	Ladonia, Mo.
Merwin, Edgar . . . . .	Edwardsville, Ill.
Middlebrooks, George Fred . . . . .	Hope, Ark.
Monroe, Lee Elsworth . . . . .	Eureka, Mo.
Newman, Percy . . . . .	St. Louis, Mo.
O'Rielly, William . . . . .	Alsey, Ill.
Patterson, Jacob Bruce, A.B . . . . .	Orangeville, Pa.
Peacock, Burton Earl . . . . .	Moline, Ill.
Poston, Harry Prewitt . . . . .	Bonne Terre, Mo.
Prichard, James Eugene . . . . .	Aurora, Ill.
Ragland, Dallas Case . . . . .	Springfield, Ill.
Reinhardt, Gustav . . . . .	St. Louis, Mo.
Reinhardt, Oscar F. . . . .	New Baden, Ill.
Rich, William Lafayette . . . . .	Paris, Idaho.
Robinson, Leonard Hughes . . . . .	Warrensburg, Mo.
Royston, Grandison Delaney . . . . .	Washington, Ark.
Sale, Llewellyn . . . . .	St. Louis, Mo.
Schweninger, Edward Alexander, Ph.D. . . . .	St. Louis, Mo.
Shadid, Michael . . . . .	Beirut, Syria.

## 248 WASHINGTON UNIVERSITY MEDICAL DEPARTMENT.

NAME.	RESIDENCE.
Simpson, Joseph Hilary . . . . .	Tipton, Mo.
Skaggs, Charles S. . . . .	Hamburg, Ill.
Sparling, Arthur Marion . . . . .	Sailor Springs, Ill.
Spivy, Raymond Mills . . . . .	Henderson, Texas.
Story, James Goree . . . . .	Harrison, Ark.
Sutter, John Ritter . . . . .	Edwardsville, Ill.
Tillmanns, Charles Samuel Jonathan . . . . .	St. Charles, Mo.
Urban, Robert Oliver . . . . .	Louisiana, Mo.
Vinyard, Paul . . . . .	Jackson, Mo.
Total, 55.	

### THIRD YEAR CLASS.

Bell, Robert Hamilton . . . . .	Carlinville, Ill.
Bird, James B. . . . .	Mason City, Ill.
Bodine, Rufus Howard . . . . .	Paris, Mo.
Boren, Albert James . . . . .	Liberty, Ill.
Bowman, John Clark . . . . .	Sturgeon, Mo.
Cantrell, Ira Jones . . . . .	Kansas City, Mo.
Clark, Edward Spencer, A.B. . . . .	Warrensburg, Mo.
Cockrell, Eugene Peyton, Ph.B. . . . .	Lamar, Mo.
Colvert, George Washington . . . . .	Vandalia, Mo.
Dames, Alphonse Ferdinand . . . . .	St. Paul, Mo.
DuMars, Elliot Callender . . . . .	Peoria, Ill.
Duncan, Fred Wallace . . . . .	Marshall, Mo.
Ellery, William Linton . . . . .	LaGrange, Mo.
Engleman, Oscar R. . . . .	Cape Girardeau, Mo.
Englert, Victor I., Ph.G. . . . .	St. Louis, Mo.
Esselbruegge, Fred. C. . . . .	St. Louis, Mo.
Evers, Emile T. . . . .	St. Louis, Mo.
Gallagher, John Francis . . . . .	O'Neil, Neb.
Gardner, Charles Campbell . . . . .	Leigh, I. T.
Glaser, Martin Joseph, Ph.G. . . . .	St. Genevieve, Mo.
Gray, John Worth . . . . .	Hickory Valley, Ark.
Gundlach, Arthur . . . . .	St. Louis, Mo.
Harrell, Henry Jackson . . . . .	Springfield, Mo.
Hayes, Karl Lovell . . . . .	Pleasant Plains, Ill.
Henske, Andrew C., A.B. . . . .	St. Louis, Mo.
Hyndman, Charles Elihu . . . . .	Sparta, Ill.

NAME.	RESIDENCE.
Jones, Edward Baxter . . . . .	Jacksonville, Texas.
Khourl, Mitri Flad . . . . .	Beyrut, Syria.
Kirby, Henry Hodgen . . . . .	Harrison, Ark.
Knott, Albert William . . . . .	Westville, Mo.
Lawler, Thomas Augustus . . . . .	Rushville, Ill.
Leslie, Walter Logan . . . . .	Russellville, Mo.
Lipsitz, Samuel . . . . .	Dallas, Texas.
Martin, Samuel P. . . . .	E. Prairie, Mo.
McPheeters, Samuel Brown, A.B. . . . .	St. Louis, Mo.
Mercer, Ray . . . . .	Liberty, Ill.
Nichols, Arthur A. . . . .	Fargo, N. Dak.
Parker, Harry Field . . . . .	Warrensburg, Mo.
Peters, Augustus William, Ph.G. . . . .	Brenham, Texas.
Pitzman, Marsh, A.B. . . . .	St. Louis, Mo.
Pope, Boyd Henderson . . . . .	Winfield, Kans.
Ratcliff, Ernest, Jr. . . . .	St. Louis, Mo.
Roe, Thomas Hamilton . . . . .	Pinckneyville, Ill.
Ross, Jno. Fredrick . . . . .	Littleton, Ill.
Schulenburg, August Carl . . . . .	{ Lichterburg, Transvaal, S. A.
Smith, William Hope . . . . .	Mineola, Texas.
Sullivan, Francis Joseph, A.B., A.M. . . . .	St. Louis, Mo.
Tribble, George Barnett . . . . .	Piasa, Ill.
Wahl, Eugene, Jr. . . . .	Edwardsville, Ill.
Wallis, Marshall, B.Sc. . . . .	Lebanon, Ill.
Weber, Peter John, Ph.G. . . . .	St. Louis, Mo.
Weir, Marshall Webster . . . . .	Belleville, Ill.
Weiss, Wm. . . . .	St. Louis, Mo.
Zelle, Fredrick Francis, A.B. . . . .	St. Louis, Mo.
	Total, 54.

## FOURTH YEAR CLASS.

Alexander, Robert DuBose, A.B. . . . .	Oak Ridge, La.
Ambrister, Joseph Campbell . . . . .	Norman, Okla.
Anderson, Orville Bradley . . . . .	Keytesville, Mo.
Beeson, John Pierce . . . . .	Noel, Mo.
Betts, Clarence Earnest . . . . .	Hammond, Ill.
Brewster, Bert Marlon . . . . .	Macedonia, Mo.

# 250 WASHINGTON UNIVERSITY MEDICAL DEPARTMENT.

NAME.	RESIDENCE.
Bribach, Eugene John . . . . .	St. Louis, Mo.
Brossard, Pierre Mayerle . . . . .	Kirkwood, Mo.
Chalkley, A. Judson, A.M. . . . .	Big Stone Gap, Va.
Cline, Harry Xenophon . . . . .	Marion, Ill.
Cook, Jerome Epstein . . . . .	St. Louis, Mo.
Doron, Paul Rimer . . . . .	Harrisonville, Mo.
Fildes, Vernon Silvester . . . . .	Louisville, Ill.
Fischel, Walter, A.B. . . . .	St. Louis, Mo.
Goodman, Dan Carson . . . . .	Springfield, Ill.
Gregg, Arthur Mitchell . . . . .	Joplin, Mo.
Griffith, Harry Melvin, Ph.B. . . . .	Mt. Ayr, Ia.
Guggenheim, Louis Kaufman . . . . .	St. Louis, Mo.
Hale, Jesse Wilburt . . . . .	St. Louis, Mo.
Hamilton, Buford Garvin . . . . .	Fargo, N. Dak.
Hastings, James Barnard . . . . .	Upper Alton, Ill.
Hawkins, George Giles . . . . .	Paris, Mo.
Hayward, Joseph William . . . . .	Paris, Idaho.
Hirsh, Albert . . . . .	Girard, Ill.
Hooss, Charles Henry Albert . . . . .	Perryville, Mo.
Huelshmann, Leo C., A.B. . . . .	St. Louis, Mo.
Jacobs, Max William, A.B. . . . .	St. Louis, Mo.
James, Jasper Milton . . . . .	Sellers, Ill.
Kern, Bert Chamberlain . . . . .	Colorado Springs, Colo.
Klenk, Charles Leonard . . . . .	St. Louis, Mo.
Knewitz, Otto W . . . . .	New Athens, Ill.
Kress, Clarence Cameron . . . . .	St. Louis, Mo.
Lane, George Garfield . . . . .	Rich Hill, Mo.
Lightner, Oscar Newton . . . . .	Wichita, Kans.
Lincoln, Harry F., Jr. . . . .	Kirksville, Mo.
Lumley, Zoda D. . . . .	Kampsville, Ill.
McAmis, Leon Clifford, Ph.B. . . . .	St. Louis, Mo.
McKnelly, Charles Everett, A.B. . . . .	Bible Grove, Ill.
McMillan, Paul Duncan . . . . .	Maryville, Mo.
McMurdo, William Wilford . . . . .	Marissa, Ill.
McNutt, James Carson, A.B. . . . .	Hammond, Ill.
Minton, William Henry . . . . .	Fortescue, Mo.
Moore, Sherwood . . . . .	Lynchburg, Va.
Nalley, Thomas J., Jr. . . . .	Louisiana, Mo.
Nettles, Frank Henry, Ph.G. . . . .	Cape Girardeau, Mo.
Nuss, Oscar William . . . . .	Louisville, Ky.

## STUDENTS.

251

NAME.	RESIDENCE.
Park, George Matthew . . . . .	St. Louis, Mo.
Riess, John Turk . . . . .	Red Bud, Ill.
Schlernitzauer, Robert A. . . . .	Millstadt, Ill.
Senseney, Eugene Towner, A.B. . . . .	St. Louis, Mo.
Sheahan, Edwin L. . . . .	St. Louis, Mo.
Shields, Daniel Francis . . . . .	Carrollton, Mo.
Smith, Seth Paine . . . . .	St. Louis, Mo.
Strode, Robert Caldwell . . . . .	New London, Mo.
Thomas, Earl . . . . .	Denver, Colo.
Thompson, Henry Herbert, B.Sc., A.M. . . . .	Nashville, Ill.
VanMeter, Eugene R. . . . .	Elkhart, Ill.
Vonnahme, Conrad Benedict . . . . .	E. St. Louis, Ill.
Weisert, Charles . . . . .	St. Louis, Mo.
Wilson, Elisha Hall Gregory . . . . .	Cape Girardeau, Mo.
Wilson, Robert Manton . . . . .	Columbus, Ark.
Wobus, Reinhard E. . . . .	Quincy, Ill.
Wright, Chauncey Goodrich, B.Sc. . . . .	Oberlin, O.
Zell, Augustine M. . . . .	St. Louis, Mo.
Total, 64.	

## GRADUATE STUDENTS.

- Bartlett, Willard, A.M., M.D. (Anatomy.) St. Louis, Mo.
- Butler, John, M.D. (Ophthalmology.) St. Louis, Mo. Beaumont Hospital Medical College, 1891.
- Calhoun, James Graham, A.B., M.D. (Ophthalmology.) St. Louis, Mo. Medical Department Washington University, 1896.
- Fitzgerald, William T. F., M.D. (Clinical Medicine.) Greenville, Ohio. Medical Department, University of Wooster, 1891.
- Greby, William, M.D. (Clinical Medicine.) E. St. Louis, Ill. Medical Department, University of Pennsylvania, 1889.
- Gaines, Marlon Toulmin, M.D. (Dermatology.) Toulminville, Ala. Medical College of Alabama, 1890.
- Hall, Fred B., M.D. (Anatomy.) St. Louis, Mo.
- Hartford, John S., M.D. (Clinical Medicine.) Colony, Okla. Kansas City Medical College, 1901.
- Horwitz, A. E., A.B., M.D. (Anatomy.) St. Louis, Mo.
- Hutton, John Wesley, M.D. (Clinical Medicine.) Wichita, Kans. St. Louis Medical College, 1883.



## 252 WASHINGTON UNIVERSITY MEDICAL DEPARTMENT.

- Junkin, E. A., M.D. (Clinical Medicine.) Carthage, Mo. St. Louis Medical College, 1880.
- Mowell, John Wilson, M.D. (Clinical Medicine.) Olympia, Washington. Missouri Medical College, 1888.
- Martin, James A., M.D. (Clinical Medicine.) Richmond, Va. University of Virginia, 1902.
- Owen, William C., M.D. (Ophthalmology.) St. Louis, Mo. Missouri Medical College, 1889.
- Pinckard, Joseph A., M.D. (Genito-Urinary Surgery.) Atwood, Ill. Missouri Medical College, 1896.
- Poignée, Frank P., M.D. (Anatomy.) St. Louis, Mo. Missouri Medical College, 1890.
- Rose, Henry George, M.D. (Clinical Medicine and Surgery.) Lake Geneva, Wis. Medical Department, University of Denver, 1896.
- Smith, Ulysses Scott, M.D. (Ophthalmology.) St. Louis, Mo. Medical Department Washington University, 1898.
- Swisher, Abraham Z., M.D. (Ophthalmology.) Des Moines, Ia. College of Physicians and Surgeons, Keokuk, 1896.
- Trigg, Joseph Milton, M.D. (Ophthalmology.) Ashland, Mo. College of Physicians and Surgeons, Keokuk, 1898.
- Van Amburg, John A., M.D. (Clinical Medicine and Surgery.) Bufordsville, Mo. Missouri Medical College, 1886.
- Veidt, Edward Julius, M.D. (Genito-Urinary Surgery.) Rockville, Mo. Missouri Medical College, 1898.
- Williamson, Llewellyn, M.D., Capt. and Surg. U. S. A. (Ophthalmology.) St. Louis, Mo. Missouri Medical College, 1897.
- Yount, William Emanuel, M.D. (Clinical Medicine.) Nashville, Tenn. Medical Department, Vanderbilt University. Total, 24.

## OTHER MATRICULANTS.

NAME.	RESIDENCE.
Brookes, Theodore Prewitt . . . . .	St. Louis, Mo.
Brown, James Alexander, D.D.S. . . . .	St. Louis, Mo.
Chrane, Victor . . . . .	Muselfork, Mo.
Calaway, William Lawrence . . . . .	Bethesda, Ark.
Fischel, Ellis . . . . .	St. Louis, Mo.
Mahood, Cecil Stanley . . . . .	Lakelet, Ont., Canada.
gtuttle, Charles P. . . . .	Litchfield, Ill.
Washer, Eb. . . . .	Kansas City, Mo.
Whittington, William E. . . . .	Dinuba, Cal. Total, 9.

**STUDENTS.****253****NUMBER OF STUDENTS IN ATTENDANCE FOR THE SESSION  
OF 1904-5.**

<b>Freshman</b>	<b>57</b>
<b>Sophomore</b>	<b>55</b>
<b>Junior</b>	<b>54</b>
<b>Senior</b>	<b>64</b>
<b>Graduate</b>	<b>24</b>
<b>Other Matriculants</b>	<b>9</b>
<hr/>	
<b>Total</b>	<b>263</b>

## GRADUATES, 1904.

The Annual Commencement was held on Thursday, May 19th, 1904, when Dr. W J McGee delivered an address to the Graduating Class, and the Chancellor of the University conferred the Degree of Doctor of Medicine upon the following gentlemen, viz. : —

NAME.	RESIDENCE.
Austin, Adelbert Morton . . . . .	Mendon, Ill.
Bader, George Washington, Ph.G. . . . .	Belleville, Ill.
Baldwin, Paul . . . . .	Kennett, Mo.
Ball, Cleo Cleveland . . . . .	Ravenden, Ark.
Ball, James Edwin, Jr. . . . .	Richmond, Mo.
Beall, Homer E. . . . .	Malden, Mo.
Beckert, John Henry, A.B. . . . .	St. Louis, Mo.
Bolton, John Frederick, A.B. . . . .	Eureka Springs, Ark.
Brandt, Frederick Arnold . . . . .	St. Louis, Mo.
Brown, Anderson Fletcher . . . . .	Malta Bend, Mo.
Brownfield, Samuel Tilden . . . . .	Richmond, Mo.
Calhoun, Delane Stow . . . . .	Sumpter, La.
Cannon, Harry . . . . .	Cresco, Ia.
Chapman, Richard Augustus . . . . .	Liverpool, England.
Clapper, William Louis . . . . .	Unionville, Mo.
Conway, William Quarles . . . . .	Lamont, Mo.
DeMenil, Henry Nicholas . . . . .	St. Louis, Mo.
Dickerson, Harry William . . . . .	Indianapolis, Ind.
Eastman, Claude Washington . . . . .	Pullman, Wash.
Evans, John Lillie . . . . .	Washington, Ind.
Feuerborn, Henry Rudolph . . . . .	St. Louis, Mo.
Fink, Frank Clarence . . . . .	Pleasant Plains, Ill.
Freund, Newton Marlon . . . . .	St. Louis, Mo.
Friedeberg, Arthur Hugo, Ph.G. . . . .	St. Louis, Mo.
Fujimori, Naokazu, M.D. . . . .	Tokyo, Japan.
Fuller, Allen Garfield . . . . .	St. Louis, Mo.
Garstang, Donald Rule . . . . .	St. Louis, Mo.

NAME.	RESIDENCE.
Gauen, George Otto . . . . .	Waterloo, Ill.
Griffin, Fred . . . . .	Nokomis, Ill.
Hope, Daniel Howard . . . . .	Shawneetown, Mo.
Horwitz, Alexander Earle, A.B. . . . .	St. Louis, Mo.
Hudson, John Rodgers, Ph.B., M.D. . . . .	St. Louis, Mo.
Jones, Harry Lander, A.B. . . . .	Blaser, Mo.
Kelthley, Chiles Lester, A.B. . . . .	Cincinnati, Mo.
Keller, Jacob Mollor . . . . .	Steleville, Ill.
Kilpatrick, George Alexander . . . . .	Wilburton, I. T.
Kirby, Franklin Beverly, A.B. . . . .	Harrison, Ark.
Koenig, George Washington . . . . .	St. Louis, Mo.
Kroeger, George Baldwin . . . . .	St. Louis, Mo.
LeBlen, Ernest Albert, Ph.G . . . . .	Lincoln, Kans.
Lenz, Herman John . . . . .	Eau Claire, Wis.
Lester, Rollo Bertell . . . . .	Valle Mines, Mo.
Lischer, Robert Franklin . . . . .	Mascoutah, Ill.
Long, Frank Leo . . . . .	DeSoto, Mo.
Maloy, Earl Dee . . . . .	Lometa, Texas.
Marnell, Frank Sterling . . . . .	Nebraska City, Neb.
Martin, John Galbraith . . . . .	Hughesville, Mo.
Mayes, Earle Garfield . . . . .	Illlopolis, Ill.
Mayes, Joseph Frank, Ph.B. . . . .	Pryor Creek, I. T.
Monday, Lewis Robert . . . . .	Stoutland, Mo.
Nolan, John Alonzo . . . . .	Millstadt, Ill.
Rohlfing, Arthur Hermann . . . . .	St. Louis, Mo.
Scholz, Roy Philip . . . . .	St. Louis, Mo.
Shahan, William Ewing, A.B. . . . .	St. Louis, Mo.
Singer, Jacob Jess . . . . .	St. Louis, Mo.
Snodgras, Charles Alvin . . . . .	St. Louis, Mo.
Stayner, Ira Clarence . . . . .	Spencerville, O.
Terry, Harry Alfred . . . . .	Prophetstown, Ill.
Tooker, Charles William, Jr. . . . .	St. Louis, Mo.
Weber, Frank Joseph . . . . .	Olney, Ill.
Whaley, Roy Wallace . . . . .	Browning, Mo.
Wolter, Otto Leonard . . . . .	Otter Tail, Minn.
Woodbridge, Jahleel Hamner . . . . .	Marshall, Mo.
Yerkes, Lathy Leverett . . . . .	Upper Alton, Ill.

## HOSPITAL APPOINTMENTS.

The Graduates of the Medical Department of Washington University are entitled to compete, on equal terms with those of other colleges, for positions on the resident staff of the St. Louis City and Female Hospitals.

Appointments are also made from the graduating class each year to the following Hospitals, viz.: Washington University Hospital, Mullanphy, St. Anthony's, Bethesda, Baptist Sanatorium, Insane Asylum and Poor House.

JUNE 1, 1904.

This year thirty positions as internes at the St. Louis City and Female Hospitals were awarded after competitive examination conducted by the Board of Health of the City of St. Louis.

Twenty-two of these positions were awarded graduates of 1904 of this School. A list of their names follows: —

Dr. G. W. Bader.  
Dr. John H. Beckert.  
Dr. S. F. Brownfield.  
Dr. W. L. Clapper.  
Dr. H. W. Dickerson.  
Dr. C. W. Eastman.  
Dr. John L. Evans.  
Dr. Newton M. Freund.  
Dr. John R. Hudson.  
Dr. H. L. Jones.  
Dr. F. B. Kirby.

Dr. G. W. Koenig.  
Dr. G. B. Kroeger.  
Dr. H. J. Lenz.  
Dr. J. F. Mayes.  
Dr. H. F. Rohlfing.  
Dr. R. P. Scholz.  
Dr. W. E. Shahan.  
Dr. J. J. Singer.  
Dr. Chas. W. Tooker.  
Dr. Otto L. Wolter.  
Dr. Jahleel H. Woodbridge.

## PROMOTIONS AND OTHER HOSPITAL APPOINTMENTS.

JUNE 1, 1904.

### CLASS OF 1902.

DR. J. M. PFEIFFENBURGER . Asst. Sup. Female Hospital.

### CLASS OF 1903.

DR. CARL ALTHANS . . . . Senior Asst. City Hospital.  
DR. W. N. HOOTON . . . . Senior Asst. City Hospital.  
DR. F. H. NIES . . . . Senior Asst. City Hospital.  
DR. JOS. DAVIE . . . . Senior Asst. Female Hospital.  
DR. HENRY PACE . . . . Senior Asst. Female Hospital.  
DR. M. C. TUHOLSKE . . . Senior Asst. Female Hospital.  
DR. H. V. WILSON . . . . Interne Jewish Hospital.  
DR. LOUIS HUNKER . . . . Interne Wabash Hospital, Peru, Ind.

### CLASS OF 1904.

DR. WILLIAM Q. CONWAY . . Interne St. Luke's Hospital.  
DR. DANIEL H. HOPE . . . Interne St. Luke's Hospital.  
DR. DONALD B. GARSTANG . Interne Mullauphy Hospital.  
DR. HARRY CANNON . . . . Interne St. Josephine Hospital.  
DR. ALEXANDER E. HORWITZ . Interne St. Louis Female Hospital.  
DR. JOHN G. MARTIN . . . Interne Baptist Sanatorium.  
DR. HARRY A. TERRY . . . Interne Baptist Sanatorium.  
DR. GEORGE O. GAUEN . . . Resident Phys. Maternity Dept.

## PRIZES AND HONORS.

1903-4.

### GILL PRIZE IN ANATOMY.

Walter Matthews Jones.

### HONORABLE MENTION.

Leo. George Bartels,  
John Leslie Courtright,  
Martin George Fronske,  
Frank F. Jackson,

George Bruce Lemmon,  
Jacob Bruce Patterson,  
Dallas Case Ragland,  
Paul Vinyard.

### GILL PRIZE IN DISEASES OF CHILDREN.

Dr. Jacob Jesse Singer.

### CURTMAN PRIZE IN CHEMISTRY.

Walter Matthews Jones.

### HONORABLE MENTION.

Martin George Fronske,  
Edward Alexander Schweninger.

Dallas Case Ragland,

The following graduates received publicly honorable mention  
for general excellence in the work of the four years' course:—

Dr. Adelbert Morton Austin,  
Dr. John Lillie Evans,  
Dr. Newton M. Freund,  
Dr. Arthur Hugo Friedeberg,  
Dr. Fred Griffin,

Dr. Franklin Beverly Kirby,  
Dr. Rollo Bertell Lester,  
Dr. William Ewing Shahan,  
Dr. Charles William Tooker,  
Dr. Jahleel Hammer Woodbridge.

## GRADUATES, 1905.

The Annual Commencement was held on Thursday, May 25th, 1905, when Professor Abraham Jacobi, of New York, delivered an address to the Graduating Class, and the Chancellor of the University conferred the Degree of Doctor of Medicine upon the following gentlemen, viz. : —

Alexander, Robert DuBose, A.B.  
Ambrister, Joseph Campbell  
Anderson, Orville Bradley  
Beeson, John Pierce  
Betts, Clarence Earnest  
Brewster, Bert Marion  
Bribach, Eugene John  
Brossard, Pierre Mayerle  
Chalkley, A. Judson, A.M.  
Cline, Harry X.  
Cook, Jerome Epstein  
Doron, Paul Rimer  
Fildes, Vernon Sylvester  
Fischel, Walter, A.B.  
Goodman, Dan Carson  
Gregg, Arthur Mitchell  
Griffith, Harry Melvin, Ph.B.  
Guggenheim, Louis Kaufman  
Hale, Jesse Wilbert  
Hamilton, Buford Garvin  
Hastings, James Barnard  
Hawkins, George Giles  
Hayward, Joseph William  
Hirsch, Albert  
Hooss, Charles Henry Albert  
Huelsmann, Leo C., A.B.  
Jacobs, Max William, A.B.  
James, Jasper Milton  
Kern, Bert Chamberlain  
Klenk, Charles Leonard  
Knewitz, Otto  
Kress, Clarence Cameron

Lane, George Garfield  
Lightner, Oscar Newton  
Lincoln, Harry F., Jr.  
Lumley, Zoda D.  
McAmis, Leon Clifford, Ph.B.  
McKnelly, Charles Everett, A.B.  
McMillan, Paul D.  
McMurdo, William Wilford  
McNutt, James Carson, A.B.  
Minton, William Henry  
Moore, Sherwood  
Nalley, Thomas J., Jr.  
Nettles, Frank Henry, Ph.G.  
Park, George M.  
Riess, John Turk  
Schlernitzauer, Robert A.  
Senseney, Eugene Towner, A.B.  
Sheahan, Edwin L., A.M.  
Shields, Daniel Francis  
Smith, Seth Paine  
Strode, Robert Caldwell  
Thomas, Earl  
Thompson, Henry Herbert, B.S.,  
A.M.  
Van Meter, Eugene B.  
Vonnahme, Conrad Benedict  
Wilson, Elisha Hall Gregory  
Wilson, Robert Manton  
Wobus, Reinhard E.  
Wright, Chauncey Goodrich, B.Sc.  
Zell, Augustine M.

Total, 62.



## HOSPITAL APPOINTMENTS.

MAY 28, 1905.

This year thirty-two positions as internes at the St. Louis City and Female Hospitals were awarded after competitive examination conducted by the Board of Health. Twenty-six graduates of the class of 1905 of this School took the examinations and the following twenty-two have received appointments, viz. : —

Walter Fischel, A.B., M.D.	Leo C. Huelsmann, A.B., M.D.
Conrad Benedict Vonnahme, M.D.	Bert Marion Brewster, M.D.
Eugene John Bribach, M.D.	Arthur Mitchell Gregg, M.D.
Bert Chamberlain Kern, M.D.	A. Judson Chalkley, A.M., M.D.
Paul D. McMillan, M.D.	Sherwood Moore, M.D.
Louis Kaufman Guggenheim, M.D.	George Giles Hawkins, M.D.
Jesse Willbert Hale, M.D.	Robert Caldwell Strode, M.D.
Robert DuBose Alexander, A.B., M.D.	Zoda D. Lumley, M.D.
George M. Park, M.D.	Edwin L. Sheahan, A.M., M.D.
Harry F. Lincoln, Jr., M.D.	Max William Jacobs, A.B., M.D.
Jerome Epstein Cook, M.D.	Clarence Earnest Betts, M.D.

## PRIZES AND HONORS.

1904-5.

### GILL PRIZE IN ANATOMY.

Phelps C. Hurford.

### INSTRUCTOR'S PRIZE IN ANATOMY.

Frederick W. Bechtold.

### HONORABLE MENTION.

H. M. Young, H. Sandperl, E. T. Brand, H. Rich, C. A. Gundlach

### GILL PRIZE IN DISEASES OF CHILDREN.

Dr. Walter Fischel.

### CURTMAN PRIZE IN CHEMISTRY.

Phelps C. Hurford.

### HONORABLE MENTION.

H. Sandperl, H. Rich.

### GILL SCHOLARSHIP FOR 1905-6.

Martin George Fronske.

### HONORABLE MENTION.

The following graduates received publicly honorable mention for general excellence in the work of the course of four years in this School: —

Walter Fischel, A.B., M.D.

Eugene T. Senseney, A.B., M.D.

Leo C. Huelsmann, M.D.

Robert D. B. Alexander, A.B., M.D.

Jerome E. Cook, M.D.

Louis K. Guggenheim, M.D.

Bert C. Kern, M.D.

James B. Hastings, M.D.

Joseph W. Hayward, M.D.

Henry H. Thompson,

B.S., A.M., M.D.

Eugene J. Bribach, M.D.

## **RULES FOR THE GUIDANCE OF STUDENTS.**

Definite times are set for holding the examinations of each half-year's work (see Calendar). If for any reason a student wishes an examination at any other than the regular times, he may have it with the consent of his instructor and on the payment of a fee of five dollars to the Registrar.

Examinations in all lecture courses will be conducted in writing, and the value of the returned papers will be indicated by the letters, A, B, C, D and E, which expressed in percentages are: —

A	90 to 100	per cent,
B	75 to 90	“ “
C	65 to 75	“ “
D	40 to 65	“ “
E	Below 40	“ “

The grade C is the lowest which a student may receive and yet pass an examination. The grade D implies that the student is conditioned and must take the examination over again; while the grade E signifies an absolute failure and a student receiving this mark must repeat the course in which he has failed before he can have another examination.

A student conditioned a second time in a given subject must take the subject again in class before he will be re-examined in it.

Two years is the maximum time allowed for the accomplishment of one year's work. A student failing to comply with this regulation shall be compelled to withdraw from the School.

No credit will be given to a student for a year's work until he has satisfactorily completed all work for preceding years.

A student who is allowed to take advance work shall receive no credit for that work until he has completed the studies of the year to which such course or courses belong.

A student who fails of promotion shall be required to pursue and pass examinations in all work of the class to which he belongs. Such students, moreover, shall pay full tuition for four consecutive years spent in this school and none thereafter. Students must pay laboratory fees for every laboratory course taken.

Students are responsible for their behavior, and the Faculty reserves the right to terminate the connection of any student with this institution if, for any cause, he shall prove himself unfit to pursue his professional studies.

## CLINICAL REPORTS.

### AN UNUSUALLY EARLY CASE OF CANCER OF THE CERVIX UTERI.

(From the Gynecological Clinic, Washington University Hospital:  
Prof. H. S. Crossen in Charge.)

BY DR. FRED. J. TAUSSIG.

It is unfortunately true that the majority of cases of uterine cancer come into the hands of the gynecologist either in an inoperable condition or in such an advanced stage that even the most radical procedure offers slim chance for recovery.

The following case is therefore of interest inasmuch as the patient had absolutely no symptom referable to the malignant trouble, and that only after microscopic examination could the pin-head nodule near the external os be identified as a beginning cancer of the vaginal portion of the cervix.

The anamnesis of the case was: Mrs. B., widow, aged 49. One child 20 years ago, at which time she was torn and was ill for 6-7 months afterwards. Menopause 7 years ago. Has for the past few months complained of backache and a dragging sensation in the pelvis and has noticed that her womb seems to come down some. On such occasions she has to urinate frequently, but at other times there are no urinary symptoms. Slight discharge for many years. Has had no previous treatment except for indigestion.

On physical examination the patient is seen to have thick abdominal walls and is in generally good condition. The perineum and pelvic floor show a laceration to the second degree. On bearing down there is some prolapse of the anterior and posterior vaginal walls. A slight whitish discharge.

Uterus difficult to outline, apparently in retroflexion and adherent. Cervix hard, points forward, movable. Ovaries and tubes could not be felt. No tenderness.

On specular examination there could be seen an erosion extending to the right from the external os, about the size of a half-dime and at its margin were two pin-head nodules. Some leucorrhoeal discharge.

Astringent douches were ordered several times daily and silver nitrate (4 per cent) applied to the erosion. On the second and third treatment it was noted that these minute nodules had a tendency to bleed when rubbed with cotton, so on the latter occasion a piece was excised from this portion of the cervix for microscopic examination.

It showed as seen in the accompanying illustration the typical picture of a beginning epithelioma of the cervix. The cancer had not yet penetrated deeper than 1-2 mms. beneath the surface epithelium. Portions cut on a later occasion nearer the external os showed that the maglinant process had developed in the base of an erosion, as the clinical picture seemed to indicate.

In spite of all explanations the patient refused to undergo any operation. The suspicious area was clipped off and pure formol applied to the surface, in the hope of at least checking to some extent the advance of the disease. She was told that she was almost certain to have a return of her symptoms and that then it might be too late to relieve her even by operation.

In February of this year, eight months after she first came to the clinic, I had occasion to see her, and she at that time said that no bleeding or other symptoms of malignant disease had developed.

It will be of great interest to follow up the development of this case. While it is of course more than likely that a return of her trouble will occur within the next two years, it is still possible in view of the superficial character of the growth that by the several excisions and caustic applications, the malignant process was eradicated. It should be added that after leaving the clinic the

patient went to a charlatan who made several applications of a caustic salve.

Still it would be false logic to suppose that just because in one or two exceptional cases the lesser operative procedures, such as excision or cervical amputation meets with success, that these very early cases do not require treatment. On the contrary, we know from the microscopic examinations of Kundrat, Kroemer and others, that often a beginning cancer of the cervix will already have metastases in the parametrium. Hence, even in cases such as the one just described, the only proper procedure is the abdominal radical operation with extirpation of the parametrium.

## MYCOTIC VAGINITIS DURING PREGNANCY.

(From the Gynecological Clinic, Washington University Hospital: Dr. H. S. Crossen in Charge.)

BY DR. FRED. J. TAUSSIG.

The hypersecretion and serous infiltration of the vaginal mucosa during pregnancy seem to be particularly favorable for the development of vegetable parasites. When, as occasionally happens, they gain access to this region, they multiply in great numbers and give rise to local irritation and symptoms of a typical character.

While very little mention of mycotic vaginitis is made in literature and even many of our text-books on obstetrics treat the subject slightly, the condition is apparently not such a rare one. Many cases are doubtless classed simply as an irritating leucorrhoea and since astringent antiseptic douches usually cause a rapid disappearance of symptoms, further investigations as to the etiology are usually neglected by the physician.

In view of these facts the report of the following case seems justifiable.

Frances S., aged 38, housewife, came to the gynecological clinic, Washington University Hospital, on Dec. 9, 1904, to seek relief from a severe burning about the external genitals and a profuse vaginal discharge. She stated that she had been married 12 years and had had nine children. With the last five deliveries forceps had to be resorted to owing to size of the children, but no puerperal infection resulted. Last regular menstruation June 20th. Felt life about the middle of October. Previous to this pregnancy she had not suffered with leucorrhoea but since about July noticed a discharge gradually increasing in amount of a whitish color and serous, though at times mixed with "small pieces." This discharge caused a more or less continuous burning about the external genitals and a severe itching — some burning also on urination but no increased frequency. Bowels costive. Only treatment heretofore has consisted of an occasional carbolic acid douche. This did not give her much relief.

On examination the uterus was found to extend 2 fingers breadth above the umbilicus. The external genitals showed a diffuse reddening, perineum torn to second degree. On the vaginal wall not far from the meatus of the right Bartholinian gland could be seen a white patch raised from the surface of the mucosa, the size of a half-dime, finely granular in appearance. This patch could without difficulty be scraped away from its base leaving a surface that bled only slightly and with apparently only a very superficial loss of tissue.

Three or four patches similar to the one just described were also found at other points on the vaginal mucosa. There was a profuse whitish serous, slightly granular, discharge; the vaginal walls were as a whole reddened and on digital examination proved somewhat tender; consistency soft and oedematous. Cervix showed typical changes of pregnancy. Fetal head felt in pelvis.

Patient was told to use 1 per cent luke-warm carbolic acid douches three times a day, and instructed to apply 10 per cent chlorotone ointment externally to relieve the pruritus. As the



patient did not return for further treatment, it is probable that this gave her relief from her symptoms.

A bit of the tissue removed from one of the patches was examined microscopically. It showed desquamated squamous epithelia, and large masses of fungus mycelia as seen in the accompanying micro-photograph. Unfortunately cultures were not made at the time of her first and only visit and she later passed from observation.

The two vegetable parasites most frequently found in these cases are the leptothrix and the thrush fungus (*Oidium-Monilia*). From the microscopic appearance a leptothrix infection can be pretty well excluded, as the threads were not particularly long. Moreover this form of mycotic vaginitis is according to v. Rosthorn not attended with the formation of large patches but only causes a granular discharge. It was E. Martin in 1858 who first showed the identity of the fungus found in these cases with that causing the ordinary thrush in the mouth of the newborn. The most thorough study of this condition was made by von Herff (*Ueber Scheidenmykosen*, Volkmann's Sammlung, N. F. No. 137). He found that *Oidium lactis* was by no means the only fungus found in these cases but also *Monilia albicans*, *Monilia candida* and in one case one of the yeast fungi. He finds this vaginitis most frequent during the summer months and in pregnant women.

There is usually only slight leucocytic infiltration at the base of the mycotic patches. The fungi being all aerobic, they do not penetrate deeper in the tissues of the vaginal wall. We never see the granular appearance of the vagina found in other inflammations of that membrane. In diabetes mellitus the growth of these fungi seems to be particularly luxurious.









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